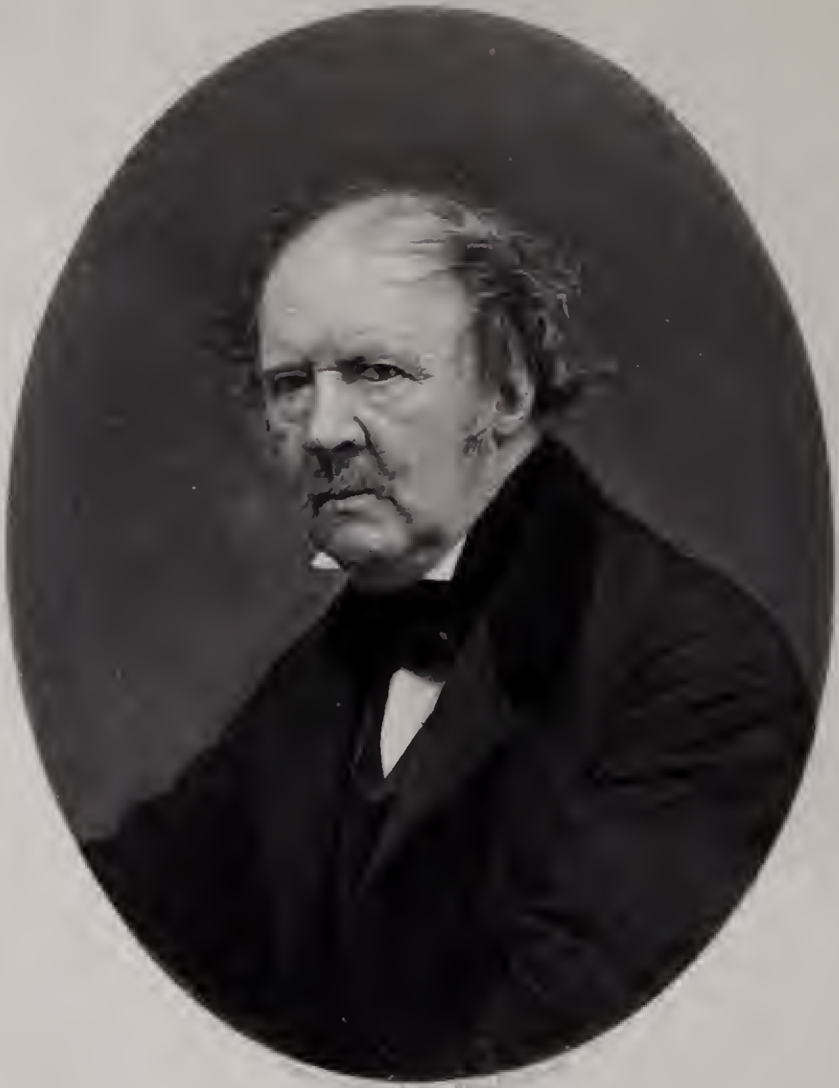
Beverly Hills
Bookbinding Service
(213) 278-0148

PATENT OFFICE LIBRARY

Supplement to the PHOTOGRAPHIC NEWS, March 11th, 1881.



FOX TALBOT

THE

PHOTOGRAPHIC NEWS:

A WEEKLY RECORD

OF THE

PROGRESS OF PHOTOGRAPHY.

VOLUME XXV.

Nulla recordanti lux est ingrata.—MARTIAL.

LONDON:
PRINTED AND PUBLISHED BY PIPER AND CARTER,
5, CASTLE STREET, HOLBORN, LONDON, E.C.

1881.

LONDON:

PIPER AND CARTER, PRINTERS, CASTLE STREET, HOLBORN, E.C.

THE GETTY CENTER

INDEX.

Abney, Capt., R.E., F.R.S., Iodide and ammonia in gelatine emulsions, 8, 20
——, A photographic sunshine recorder, 10
——, Soluble bromide in gelatine emulsion, 198
——, Some remarks on the natural camera, and on uncorrected lenses in photography, 200
——, An unsuspected cause of thin images with the ferrous oxalate developer, 255
——, Lens or no lens, 267
——, Development with ferrous oxalate, 279
——, The utilization of thin gelatine plates, 305
——, Gelatine-emulsion-making in hot weather, 309
——, the spectrum impressed on gelatino-chloride of silver emulsion, 338
——, On substrata, 352
——, A new form of the ferrous citrate developer, 368
——, Gelatino-chloride of silver emulsion, 400
——, Intensity of image in gelatine negatives, 415
——, Ferrous-oxalo-citrate developer, 483
——, Collodio-chloride emulsion for development, 499
——, Method of mixing gelatine emulsions, 512
——, Halation, 615
——, Halation and the development of silver iodide, 578
Accessories, the use and abuse of them, by S. Bottone, 247
Acid developer on highly sensitive bromide emulsion plates, action of the, by Dr. H. W. Vogel, 129
Actinometer, A chemical, by Professor H. Dufour, 158
"Actinium," a remarkable actinic phenomenon, and the possible existence of a new metal "actinium," 409
——, the new element, 421
Actinic balance, the, 267
Adam Salomon, M., in the Rue de la Faisanderie, Paris, "At Home," 195
Adam Salomon, M., 205
Albert, Herr Hof-Photograph Josef in Munich, "At Home," 437
Alcoholic gelatine emulsion, 301
Alexander Bros., Messrs., Renfrew Street, Glasgow, "At Home,' 412
Alkaline development, variations in the, 361
Alum in silver printing, on the use of, 1
—— for reducing density, the prolonged action of, by Valentine Blanchard, 20
Alumina in the developer, ammonia citrate of, 363
Amateur photographic association, 407
Ammonia in emulsions, 37
—— with silver bromide, the formation of a chemical compound of, by J. Vincent Elsden, B.Sc., F.C.S., 174
Ammonio-citrate of alumina in the developer, 363
Ammonium bromide, is the equivalent 98 the right one ? by James Young, 557
Analysis of organic bodies by means of photography, 73
Annan, Messrs., R. and J., at Sauchiehall Street, Glasgow, "At Home," 388
Anthropologist, photography for the, 146
Anthrakotype, 76
Arctic photography, 291
Argentic gelatino-bromide paper, by W. T. Morgan, 177
Art photography, by Payne Jennings, 141
—— and photography, suggestions for bringing them into closer connection, by Herbert B. Berkeley, 212, 224
Articles de Paris, "By-the-Bye," 184
Artificial light, especially that of gas for printing, use of, 85
——, retouching by, by Rudolph, 569
Artistic element of photography, the, by J. Hutchison Simpson, 219
Ashley's Hotel, Thursday Evenings, 298, 311, 335, 347, 359, 371, 383, 395, 408, 419, 431, 442, 455, 468, 479, 491, 503, 515, 527, 540, 551, 561, 575, 587, 599, 612, 624
Asphalt, preparation of photographic, by Dr. R. Kayser, 345
Astral photography, 290
"At Home," 2, 14, 27, 62, 87, 124, 148, 171, 184, 195, 232, 256, 291, 314, 340, 364, 388, 412, 437, 460, 496, 520, 555, 590
Axolotl, the change of colour which it undergoes under the action of light, 363
Backing plates, a new method of, by Dr. Hermann Fol, 162
Bailey, Wilfred, Tissue negatives from gelatine plates, 244
Balloon trip in a thunderstorm, by W. Cohb, 295
—— photography, by W. B. Woodhury, 549, 560
Barker, J., The sensitive salts in emulsions, 15
Bath, negatives, preparation and conservation of the, 85
——, hot weather and the, 266
Bean, K., How to make a cheap folding camera stand, 622
Bedford, W., An instantaneous lens mount, 532
Beeby, Alx., Sending out proofs, what I do and why I do it, 451
Benque et Cie, MM., in the Rue Boissy D'Anglas, "At Home," 232
Berkeley, Herbert B., The platinotype process, 80
——, Art and photography, suggestions for bringing them into closer connection, 212, 224
Berwick, George, M.D., On micro-photography, 245
Bichromate of potash in the gelatino-bromide process, by Dr. J. M. Eder, and Captain Pizzighelli, 176, 182
Biny, Capt., A new method of taking transparent positives, 476
Bismuth oxide, The sensitiveness of, 99
Blanchard, Valentine, The prolonged action of alum for reducing density, 20
Bleaching of negatives treated with Edwards' intensifier, how to remedy, by Dr. J. M. Eder, 583
Bolas, T., F.C.S., The detective camera, 45 532
——, Modifications of the detective camera, 231
Bolton Photographic Society, 59, 108, 167, 216, 275, 335, 408, 419, 561, 624
Books, How I keep my, by Mrs. Eliz. H. Way, 235
Bottone, S., The use and abuse of accessories, 247
——, Photographic residues and wastes; what is worth saving, and how I save it, 547
Bradforde, G., Dry plates, dark-rooms, and printers, 619
Bradforde, G., Interiors, 7
——, A day with the "Scots Greys," 296
——, Vignettes and vignetting, 319
——, A day's ride—"Going away," 466
——, A day's ride—"Coming home," 478
Brightman, E., The use of tannic acid as a preventive of frilling and blisters, 21
——, Stray notes on gelatine plates, 116
Bristol Fine Arts Academy, the photographic exhibition at the, 47
Bristol and West of England Amateur Photographic Association, 23, 71, 120, 179, 238, 299, 335, 4t3, 516, 551
Bristol Association, the; 410, 423
Bromide, soluble, contained in a gelatino-emulsion, a method of estimating the, by W. K. Burton, 257
Broughton, W., On the etho-oxygen lime light, 94
Brown, A. J., A safe light, 357
——, Green fog, 478
——, Increasing the sensitiveness of plates by free silver nitrate, 605
——, The so-called crystallization of varnish, 620
Brussels, a visit to the Musee Industrielle, 377
Burton, W. K., Improving the setting properties of gelatine emulsion, 32
——, A, method of estimating the soluble bromide contained in a gelatine emulsion, 257
Burton, Cosmo I., and A. P. Laurie, A new mercury intensifier, 269
——, Mercury intensifiers, 536
Burton, H. J., Carbon transparencies for enlargements, 355
Business tact, "By-the-Bye," 471
"By-the-Bye," 40, 76, 100, 136, 160, 184, 207, 243, 268, 303, 328, 352, 375, 399, 424, 448, 471, 543, 568, 603
Camera and lenses, making the best of one's, 74
——, A repeating, 253
—— for dry-plate work, 458
Camera stand, how to make a cheap folding, by K. Bean, 622
Carbon printing for small work, 205
—— transparencies for enlargement, 289
—— transparencies and prints, spots on, 566
Cash at time of sitting, and how I get it, by T. M. Laws, 487
——, by B. Rhodes, 487
Celluloid, Some photographic uses of, 577
Chadwick, W. J., On lantern matters, 86
Cheltenham Amateur Photographic Society, Account of an excursion of the, by one of the party, 269
Chidley, J. J. (Melhourne), Odds and ends from the Antipodes, 381
Chloride of silver emulsion, On the sensitiveness of, by Dr. J. M. Eder, 26
——, gelatine emulsion, by H. L. T. Haakman, 62

Chloride of silver emulsion, the development of, by Dr. J. M. Eder, 203
Christian's copying process, 242
Christmas cards, by An Old Hand, 449
Christmas cards, birthday cards, and about publishing and selling, "By-the-Bye," 603
City guilds, technical examination of the, 385
City and guilds of London Institute for Advancement of Technical Education, technological examinations, 1881, 392
Clarke, Archer, Hot weather emulsion, and the development of gelatine plates, 272
——, Keeping emulsion, 622
Cliff, Club Sitters, No. 1, 308, 339
——, Wanted, an operater, 475
Club, the Photographic, 158, 168, 540
Cobb, W., A balloon trip in a thunderstorm, 295
——, Photographic printing, 406
——, My ride to York, 423
Cocking, Edwin, Photography and art, 135
Cold weather and the bath, 49
Collodion gelatine emulsion, by H. L. T Haakman, 129
—— *v.* gelatine, by A. L. Henderson, 369
Collodio-chloride emulsion for development, by Capt. Abney, R.E., F.R.S., 499
Collotype printing, new formula for, 241
Coloured photographic miniatures, 133
——, prints, 233
—— transparencies from silver images, by C. R. Woods, 621
Comet of June, 1881, photographs of the spectrum of the, by Professor H. Draper, M.D., 401
Competition, our artistic, by E. Dunmore, 67, 110
Composite portraits, 289, 291
—— portraits, by Francis Galton, F.R.S., 316, 332
Concours Photographique at Ghent, by F. F. S., 440
Condensers and front lenses for the optical lantern, by G. Smith, 220
Cooper and Co., Practical hints on saving silver and gold wastes, 449
Copying frame and vignetting pendulum, Henderson's, 416
Cornwall Polytechnic Society, photography at the, judges' report, 232
—— Royal Polytechnic Society, 434
Correspondence, 11, 21, 34, 46, 57, 68, 84, 94, 107, 117, 131, 143, 155, 166, 178, 191, 201, 214, 225, 237, 250, 261, 273, 284, 297, 310, 321, 334, 346, 358, 370, 383, 394, 406, 418, 430, 441, 454, 467, 479, 489, 503, 515, 525, 537, 550, 561, 572, 584, 596, 611, 622
Coventry, A., Gelatine jottings, 250
Cowan, Alex., Developers and developing, citric acid in the developer, 31
——, A suggestion, 569
—— machine for levelling and racking plates, 229
Cox, J. Streatfield, Subterranean photography, 259
Croughton, G., The production of a cheap and effective finished enlargement, 54, 511, 595
——, A gossip with old friends, 2[illegible]3
——, The after-treatment of gelatine negatives, 379
Cuttriss, C., Photographing the vibrations of the voice, 321
Cyanotype printing, modern, by Dr. J. M. Eder, 186
Dalton, C. K., Photographing the lightning, 4[illegible]5
Daniel, H. A. H., Gelatine plates and restrainers, 16
Dark-room, my, by Marshall Wane, 163
——, ventilation of the, 313
——, light in the, 541
—— notes, by Lyddell Sawyer, 571
Davis, G. E., F.R.M.S., Photo-micrography, 190
Davies, G. Christopher, A photographic holiday, 508
Davies, W. H., Mercurial intensifiers, 610
Dawson, G., M.A., Ph.D., Gelatino-bromide of silver emulsions, 81
Density, the prolonged action of alum for reducing, by Valentine Blanchard, 20
Des Vœux and Colton, Messrs., Patents, 168, 192, 372
Detective camera, the, by T. Bolas, F.C.S., 45
——, modification of the, by T. Bolas, 231
——, the, by T. Bolas, 532
Developers and developing, citric acid in the developer, by Alex. Cowan, 31
——, ferrous oxalate, citrate, by Capt. Abney, R.E., F.R.S., 483
Developing memoranda, 327
—— trays and lanterns for tourist photographers, 339
Development, abnormal results in, 265
——, collodio-chloride emulsion for, by Capt. Abney, R.E., F.R.S., 499
Draper, J. W., M.D., The infra-red lines or bands in the sun's spectrum, 131
Draper, Professor H., M.D., Photographs of the spectrum of the comet of June, 1881, 401
Drop shutter passing through the lens mount, a, 541
Dry-plate work, a ready, useful, and inexpensive lantern for, by "The Old Hand," 57
——, the backing of, 157
—— washing, hints on apparatus for, by A. A. Campbell Swinton, 214
—— work, cameras for, 458
——, some experiences of, by W. H. Warner, 489
Dry plates, dark-rooms, and printers, by Geo. Bradforde, 619
Dufour, Professor H., A chemical actinometer, 158
Dundee and East of Scotland Photographic Association, 71, 119, 144, 180, 287, 324, 359, 491, 539, 561, 587
Dunmore, E., On artistic competition, 67, 110
Dynamo-electrical machines driven by hand, 243
Eccentric sitters, 411
Eder, Dr. J. M., The sensitiveness of chloride of silver emulsion, 26
——, Self-luminous photographs, 139
—— and Capt. Pizzighelli, Bichromate of potash in the gelatino-bromide process, 176, 182
——, A new method of eliminating fog on gelatino-bromide plates, with some remarks on Dr. Kenyon's method of preparing bromide emulsion, 183
——, Modern cyanotype printing, 186
——, The chemical action of light, 608
——, The development of chloride of silver emulsion, 206
——, The washing of gelatino-emulsion, and on an effective method of controlling the same, 271
——, The discussion on gelatino-chloride emulsion, 387
——, The increase of sensitiveness of gelatino-bromide plates by means of an excess of silver nitrate, 405
—— and Capt. Pizzighelli, The action of the solar spectrum and chemical development of silver chloride, 428
——, The quantity of silver used up in different photographic processes, 513
Eder, Dr., J. M., At the Imperial Technical Academy in Vienna, "At Home," 520
——, How to remedy the bleaching of negatives treated with Edwards' intensifier, 583
——, The chemical action of light, 591
Edinburgh, in Prince's Street, "At Home," 364
—— Photographic Society, 23, 70, 84, 119, 132, 191, 227, 274, 299, 312, 335, 490, 539, 611
Education, individual and national, photography to aid, by T. J. Pearsall, F.C.S., 472
Edwards' intensifier, How to remedy the bleaching of negatives treated with, by Dr. J. M. Eder, 583
——, Keeping gelatine plates, 605
Electricity and photography, some points of contact between, 193
—— in Paris, The reign of, from our special correspondent, 464
—— lit theatre, an, 484
Electrical appliances, the exhibition of, 397
Electric lighting at York, 434
—— light in the studio, 483, 505
—— apparatus for photographic purposes, a complete, by A. J. Jarman, 500
—— for photographic use, by W. B. Woodbury, 535
Ellerbeck, J. H. T., A photographic trip from Liverpool to Chepstow, 315
Elsden, J. Vincent, B.Sc., F.C.S., Photography as an aid to the study of geology, 79
——, The formation of a chemical compound of ammonia with silver bromide, 174
Emulsion processes, modification of, 1
Emulsions, the sensitive salts in, by J. Barker, 15
Emulsion, Dr. Vogel's 34
——, Lohse's method of preparing, 169
——, non-putrescent and quick drying, 316
——, in hot weather, how to make, by A. L. Henderson, 356
—— keeping, by A. Clarke, 622
——, workers, seasonable hints to, 495
Emulsification in daylight, 61
Enamelling of paper prints, 97
England, W., Reduction of over-printed proofs, 251
——, Washing gelatine emulsion, 607
Enlargements, portrait enlargements from other people's negatives, 349
——, electricity on photographic, 386
——, carbon transparencies for, by H. J. Burton, 355
——, cheap and effectively finished, by G. G. Croughton, 54, 511, 595
Enlarged pictures, optical arrangement for, 373, 385
Etho-oxygen lime light, the, by W. Broughton, 94
Exhibition of the Photographic Society of Great Britain, 345
——, the photographic, 481, 493, 506, 518
——, New Zealand, 363
Exposure by shutters, measuring duration of, by A. Haddon, 380
Faded carte, a. "By-the-Bye," 100
F. F. S., On the Concours Photographique at Ghent, 410
Fergus, Mr. J., Studio at Largs, "At Home," 314
Ferrotype, the, how it is made, by W. Heighway, 29, 39, 74, 91, 105, 128
—— the, 51, 328
Ferrous citrate developer, new form of the, by Capt. Abney, R.E., F.R.S., 368
Ferrous oxalate, reversal of the photographic image during development with, by H. Wilmer, 86
——, development with, by Capt. Abney, R.E., F.R.S., 279

Field, C. Leopold, F.C.S., A perfect gas-lamp, 42
Field, photography in the, 313
——, impedimenta for the, by J. C. Stephens (Dunedin, N.Z.), 607
Foam, dried gelatine, 630
Focus, junr., Reception room notes; on receiving a sitter and taking an order, 404
Fog, a new method of eliminating fog on gelatino-bromide plates, with some remarks on Dr. Kenyon's method of preparing bromide emulsion, by Dr. J. M. Eder, 183
——, bichromate of potassium for curing, 195
——, green, 397
——, by J. A. Brown, 478
Fol, Dr. Hermann, A new method of backing plates, 162
——, Two new apparatus for washing gelatino-bromide plates, 583
France, Photographic Society of, 71, 203, 251
French Correspondence, 19, 51, 82, 104, 140, 152, 186, 222, 236, 259, 272, 280, 304, 331, 355, 389, 425, 452, 470, 500, 531, 557, 579, 593, 607, 614
French portraiture, by W. G. Shaw, 465
Frilling and blisters, tannic acid as a preventive of, by E. Brightman, 21
——, remedies for, by H. J. Palmer, M.A. 320
——, by Kagy, 427
——, alcoholic solution of tannic acid for preventing, by A. J. Jarman, 545
Frost and photography, 25
Furniture, photographic, 433
Gaffield, T., On the uses of glass in photography, 428, 441
Galton, Francis, F.R.S., On composite portraits, 316, 332
Garnier's, M., New method of photo-engraving, by Major J. Waterhouse, B.Sc., 523
Gas lamp, a perfect, by C. Leopold Field, F.C.S., 42
—— for printing, use of, 85
Gelatine dry plates, spots in, 26
——, defects in, 253
—— emulsion washing, by W. England, 607
—— *versus* collodion, 160, 243
—— emulsions, iodide and ammonia in, by Capt. Abney, R.E., F.R.S., 8, 20
——, on the adding of nitrate of silver to the bromide, 25
——, on improving the setting properties of, by W. K. Burton, 32
——, chloride of silver, by H. L. T. Haakman, 62
——, an improved method of washing, by J. M. Turnbull, 189
—— plates, keeping, by B. J. Edwards, 605
——, the drying of, 613
——, soluble bromide in, by Capt Abney, R.E., F.R.S., 198
——, a new discovery regarding, by L. Warnerke, 248
——, on the washing of, and on an effective method of controlling the same, by Dr. J. M. Eder, 271
——, alcoholic, 301
——, making in hot weather, by Capt. Abney, R.E., F.R.S., 309
——, negatives for printing in the collotype press, by Capt. G. Pizzighelli, 447
——, method of mixing, by Capt. Abney, R.E , F R.S., 512
—— jottings, by A. Coventry, 260
—— negatives, slow printing, 49
——, fixing, 145
——, how I retouch and varnish my, by J. B. Harrison, W. Shawcross, and E. A. Maxwell, 343
Gelatine plates and restrainers, by H. A. H. Daniel, 16
——, how I retouch my, by W. Shawcross, 344
——, how I retouch and varnish my, by E. A. Maxwell, 344
——, after treatment of, by G. Croughton, 379
——, intensity of image in, by Capt. Abney, R.E., F.R.S., 415
——, dry, increasing the rapidity of, 97
——, stray notes on, by E. Brightman, 116
——, a new clearing solution for, by John Cowell, 188
——, a Swiss tour with, by W. D. Howard, 196
——, utilization of thin, by Capt. Abney, R. E., F.R.S., 303
——, streaks in, 337
——, increasing the sensitiveness of, by means of free silver nitrate, 339
——, transparencies for the lantern, by J. Mayne, T.C., 172
——, bromide of silver emulsions, by G. Dawson, M A., Ph.D., 81
Gelatino-bromide process, bichromate of potash in the, by Dr. J. M. Eder and Capt. Pizzighelli, 176, 182
—— paper, 193
——, improvement in the new method of manipulating, by Leon Warnerke, 310
——, plates, substrata for, 338
—— plates, on the increase in sensitiveness by means of an excess of silver nitrate, by Dr. Eder, 405
—— plates, the thorough washing of, 554
—— plates, two new apparatus for washing, by Dr. H. Fol, University, Geneva, 583
—— plates, enlargements on, 64
—— chloride emulsion, developing pictures on, 181
——, the discussion on, by Dr. Eder, 387
—— of silver emulsion, on the spectrum impressed on, by Capt. Abney, R.E., F.R.S., 338
—— of silver emulsion, by Capt. W. Abney, R.E., F.R.S., 400
——, positive pictures on, 433, 445, 457, 470
Geoffray, S., and V. Roux, The white opalescent precipitate which often forms on gelatino-bromide plates, 357
Geology, photography as an aid to the study of, by J. Vincent Elsden, B.Sc., F.C.S., 79
Ghent, the Concours Photographique at, by F. F. S., 440
Gibson, J. B., Lightning and lightning photography, 609
Gilson, R. B., A simple curtain shutter for landscapes, 521
Glass in photography, the uses of, by Thomas Gaffield, 428, 441
Glasgow, Photographic Society of, 96, 228, 419, 490, 539, 587
Gossip with old friends, a, by G. Croughton, 223
Great Britain, Photographic Society of, 22, 69, 118, 191, 226, 287, 322, 537, 561, 599
——, Exhibition of Photographic Society of, 345
Green fog, 397
——, by A J. Brown, 478
Groups, "By-the-Bye," 136
Guiteau, photographing, 363
Gulliver, T., Sizing photographs for oil painting, 610
Haakman, H. L. T., Chloride of silver gelatine emulsion, 62
——, Collodion gelatine emulsion, 129
Hadah, Photographic residues and waste; what is worth saving, and how I save it, 548
Haddon, A., Measuring duration of exposure by shutters, 380
Halation, 565, 613
Halation, by Capt. Abney, R.E., F.R.S., 615
—— and the development of silver iodide, by Captain Abney, R.E., F.R.S., 578
Half-an-hour on photographic matters, by W. D. Valentine, 580
Hardwich, T. Frederick, The lime light, 115
Harmer, John, The application of stereoscopic photography to the science of meteorology, 126
Harrison, J. B , How I retouch and varnish my gelatine negatives, 343
Heighway, W., The ferrotype, how it is made, 29, 39, 74, 91, 105, 128
Henderson, A. L., How to make emulsion in hot weather, 356
——, Collodion *versus* gelatine, 369
Henderson's copying frame and vignetting pendulum, 416
Hot weather and the bath, 266
—— emulsion, and the development of gelatine plates, by Archer Clarke, 272
Houlgrave, H., On copying engravings by lamplight, 106
Howard, W. D., A Swiss tour with gelatine plates, 196
How to work economically, by R. Huck, 453
Huck, R., How to work economically, 453
Huggins, Dr., At Upper Tulse Hill, "At Home," 87
——, W., D.C.L., LL.D., F.R.S., Preliminary note on the photographic spectrum of comets, 357
Hydrochinon developer, the, 17
Hydro-quinone and quinone, 590
Hygroscopic condition of certain chemicals, variations in the, 349
Hyposulphite in the oxalate developer, 133
—— in the developer, 194

Illustration, our, 481
Imperial Technical Academy in Vienna, Dr. J. M. Eder, "At Home," 520
In and Out of the Studio, 4, 17, 28, 41, 50, 75, 90, 112, 123, 147, 159, 170, 194, 218, 242, 266, 281, 290, 302, 327, 363, 386, 398, 411, 436, 459, 495, 530, 566, 604
Incandescent light, Swan's, a photographic experiment with, 542
India-rubber solutions in light, 41
Infra-red lines or bands in the sun's spectrum, on the, by J. W. Draper, M.D., 131
Instantaneous photography, 267
—— shutters, note on, by the Earl of Rosse, F.R.S., 326
—— exposures, 529
Interiors, by G. Bradforde, 7
—— with gelatine plates, by H. Manfield, 102
Intensifiers, mercury, 601
——, by Cosmo I. Burton and A. P. Laurie, 530
Ireland, Photographic Society of, 46, 84, 132, 179, 252, 503, 600
Iodide and ammonia in gelatine emulsions, by Capt. Abney, R.E., F.R.S., 8, 20
——, halation and the development of silver, by Capt. Abney, R.E., F.R.S., 578

Jackson, Magnus, Photography outside the studio, 43, 56
Jameson, James, A dropping tube for dry pyrogallol, 77
Japanese imitative art, 4
Jarman, A. J., How to recover the silver in its entirety from waste gelatino-bromide of silver emulsion, 83
——, A complete electric light apparatus for photographic purposes, 500
——, Alcoholic solution of tannic acid for preventing frilling, 545
Jennings, Payne, Art photography, 141
Johnson, Mr. J. R., the late, 66

Kayser, Dr. R., The preparation of photographic asphalt, 345
Kenyon's, Dr., Method of preparing bromide emulsion, some remarks thereon by Dr. J. M. Eder, 183
——, New revolutionary powers in photography, daylight emulsification, unlimited heat, 53
—— method of preparing highly-sensitive gelatino-bromide, 211
Keeping letters—hints on business management, 602
Lady photographers, 328
Lamplight, copying engravings by, by H Hou'grave, 106
Landscape lenses, 373, 400
—— studies, by H. P. Robinson, 138, 210, 283, 330
Landscapes, a simple curtain shutter for, by R. B. Gilson, 521
Lantern, the magic, 601
——, the optical, 14
—— for dry-plate work, ready, useful, and inexpensive, by the "Old Hand," 57
—— matters, by W. J. Chadwick, 86
Largs, Mr. J. Fergus' studio at, "At Home,' 314
Laurie, A. P., and C. 1. Burton, A new mercury intensifier, 269
Laws,' T. M., The way to preserve negatives and register them, 292
——, Reception room notes: on receiving a sitter, and taking an order, 403
——, Cash at time of sitting, and how I get it, 487
Lens or no lens, by John Spiller, F.C.S., 247
——, by Capt. Abney, R,E, F.R.S., 267
—— mount, on an instantaneous, by W. Bedford, 532
——, a drop shutter passing through a, 541
Lenses, a suggestion for a standard of comparison for, 121
——, some remarks on the natural camera, and on uncorrected lenses in photography, by Capt. Abney, R.E., F.R.S., 200
——, portrait, a new construction in, 398
——, double combination landscape, 421
Lichtdruck process in detail, Herr Lowy in Vienna, "At Home," 590
Light, chemical action of, by Dr. J. M. Eder, 591 608
——-screen, a standard, 38
—— upon the soluble iodides, action of, 142, 154
——, its influence on animal life, 241
——, the management of, 301
——, a safe, by A. J. Brown, 357
——, the change of colour which oxalate undergoes under the action of, 363
——, the action on plants, 459
——, the influence of, on the growth of plants, 530
Lightning and lightning photography, by J. P. Gibson, 600
——, photographing the, by Charles Kerfoot Dalton. 405
—— photography, 412
Lime light, the, by Edward Viles, 44, 52
——, the, by T. Frederick Hardwich, 115
Lindt, J. W., The Melbourne International Exhibition, 10, 101
Liverpool to Chepstow, a photographic trip, by J. H. T. Ellerbeck, 315
—— Amateur Photographic Association, 58, 108, 167, 215, 263, 323, 527, 574
Lohse's method of preparing emulsion, 160
Lock, Mr. Samuel Robert, 230
Luckardt, Herr Fritz, at the Hotel National in Vienna, "At Home," 460
Luminous paint, transparencies produced by, by R. Vincent, 463
Lux e tenebri, by Photo-Chemicus, 381
Lowy, Herr, in Vienna, The Lichtdruck process in detail, "At Home," 590
Mammoth carte, the, 159
Manchester Photographic Society, 46, 96, 156, 203, 262, 299, 335, 347, 371, 395, 419, 455, 503, 525, 561, 612
——, Photographic Exhibition at, 525
—— Society's Exhibition and Soiree, the, 553
Manfield, H., On interiors with gelatine plates, 102
Maxwell, E. A., On how I retouch and varnish my gelatine negatives, 344
Mayne, T. C., On gelatine transparencies for the lantern, 172
Medals, about, "By-the-Bye," 76
Melbourne International Exhibition, the, by J. W. Lindt, 10, 101
—— exhibition, photography at the, 130
——, Exhibition, the, 155
Mercury intensifier, a new, by Cosmo I. Burton and A. P. Laurie, 536
—— intensifiers, by Cosmo I. Burton and A. P. Laurie, 536
——, by W. H. Davies, 610
——, 601
M'Ghie, J., On Vogel's collodio-gelatine emulsion, 415
Micro-photography, by George Berwick, M.D., 245
Midwinter, Mr. W. H., At Park Street, Bristol, "At Home," 14
Millbank, at, "At Home," 2
Miniatures, coloured photographic, 133
Morgan, Henry, Retouching for beginners, 00
Morgan, W. T., On argentic gelatino-bromide paper, 177
Morton, Dr., A short tour in North Wales, 502
Mounting prints, 577
Mucklow, J. D., F.I.C., F.C.S., and J. B. Spurge, An improved sensitometer, 621
Museum, a photographic, 99
Musee Industrielle, Brussels, a visit to the, 377
Museum, a photographic, "By-the-Bye," 448
My ride to York, by William Cobb, 423
My studio—an ow'r true tale, by An ex-Photographer, 618
M'Lellan, J. Y., A new photo-chemical light, 596
National photographic portrait gallery, A., "By-the-Bye," 375
Natural camera, some remarks on the, and on uncorrected lenses in photography, by Captain Abney, R.E., F.R.S., 200
Nebulæ, photographing, 5, 50, 90
Negative bath, preparation and conservation of the, 85
Negatives, the preservation of, 182
——, the way to preserve and register them, by T. M. Laws, 202
——, the way to preserve and register them, by a Lover of Order, 203
——, the way to preserve and register them, by John Harmer, and B. Rhodes, 307
Negative, the ownership of the, "By-the-Bye," 424
Negatives, gelatine emulsion, for printing in the collotype press, by Capt. Pizzighelli, 447
——, for single transfer carbon printing, reproduction of, by W. T. Wilkinson, 485
Nelson developer, testing the, 302
Newcastle, Photographic Association, 47, 120, 230, 324, 384, 492, 551, 612
——-upon-Tyne, the Swan collection of photographs at, 547
Nitrate of silver from dollars, making, 281
—— on gelatine plates, action of, 398
North Wales, a short tour in, by Dr. Morton, 502
Notes, 6, 18, 30, 41, 53, 65, 78, 89, 101, 113, 125, 137, 149, 161, 173, 185, 197, 209, 221, 231, 246, 258, 270, 282, 294, 306, 318, 329, 342, 354, 366, 378, 390, 402, 413, 426, 439, 450, 461, 474, 486, 498, 510, 522, 534, 546, 559, 570, 582, 594, 606, 617
Obernetter, J. B., How to take positives in the camera direct, 208
Odd jobs, by the author of "Looking Back," 153, 199, 254, 358, 416, 544
Odds and ends from the Antipodes, by J. J. Chidley, Melbourne, 381
"Old Hand," the, A ready, useful, and inexpensive lantern for dry-plate work, 57
Old and the new, the, 529
Oldham Photographic Society, 108
Oil painting, sizing photographs for, by T. Gulliver, 610
Operator, wanted, an, by Cliff, 475
Optical lantern, the, 14
Organic bodies, analysis of, by means of photography, 73
Out-door photographers, hints to, 387
—— photography, by Dr. H. W. Vogel, 374
Outside the studio, photography, by Magnus Jackson, 43, 56
Over-printed proofs, reducing, 281
——, reduction of, by W. England, 251
Oxalate developer, hyposulphite in the, 133
Paget prize, the, 28
Palmer, H. J., On paper negatives by the gelatino-bromide process, 165
——, On remedies for frilling, 320
——, On enlarging view negatives with a home-made apparatus, 524
Paper negatives by the gelatino-bromide process, by H. J. Palmer, 165
Paris studio, a, 514
Patents, Messrs. Des Vœux and Colton, 168, 192, 372
Patent laws and photography, 459
Pawnbrokers' bargains, "By-the-Bye," 399
Pearsall, T. J., F.C.S., On photography to aid individual and national education, 472
Pentonville Penitentiary, at, "At Home," 27
Phipson, Dr. T. L., On the dangers of pyrogallic acid, 508
Phosphorescent body, gelatine, a, 281
Photography outside the studio, by Magnus Jackson, 43, 56
—— as a critical agent, on the value of, by Rev. F. F. Statham, M.A., 64
—— and art, notes on, by Edwin Cocking, 135
—— and art, by Lyddell Sawyer, 151
—— to aid individual and national education, by T. J. Pearsall, F.C.S., 472
Photographs, coloured, 4
——, the publication of, "By-the-Bye," 243
Photographers and chemistry, 150
—— and the public—The relation of photographers to the public, and the public to photographers, by H. Rocher, 380
——, on, by "A Sitter," 427
Photo-Chemicus, *Lux e tenebris*, 381
——-engraving and Spence's metal, 123
—— process, new, 267
——, M. Garnier's new method of, by Major J. Waterhouse, B.S.C., 523
—— lithography, "By-the-Bye," 568
——-micrography, by George E. Davis, F.R.M.S., 190
—— tracings in black and colour, the latest method for producing, 13
——-chemical light, a new, by J. Y. M'Lellan, 596
Photographic appliances, an exhibition of, 495
—— holiday, a, by G. Christopher Davies, 503
Photographing comets, 364

Photographers' Benevolent Association, 24, 59, 179, 228, 275, 347, 413, 503, 561
Photophone, the, 4, 29, 219
Phototype, a city establishment, "At Home," 148
Physiognomy and photography, 278
Pizzighelli, Capt., and Dr. J. M. Eder, Bichromate of potash in the gelatino-bromide process, 176, 182
——, Gelatino emulsion negatives for printing in the collotype press, 447
Plante's secondary battery, 277
Plants, the influence of light on the growth of, 530
Platinotype process, the, by Herbert B. Berkeley, 80
Politics and photography, 496
Portrait lenses, about, 325
——, a new construction in, 398
Positives, to take positives in the camera direct, by J. B. Obernetter, 208
——, transparent, a new method of taking, by Capt. Biny, 476
Posing for photographs, 453
Practical hints, two, by Leon Warnerke, 111
—— experiences, 506
Precipitate, white opalescent, which often forms on gelatino-bromide plates, by S. Geoffray and V. Roux, 357
Prefecture de la Police in Paris, at the, "At Home," 256
Prints from old negatives, by the author of "Looking Back," 32
——, mounting, 577
Printing, and the burnishing of prints, 157
——, photographic, by W. Cobb, 405
—— and toning, silver, 518
Prism or mirror, 123
Progress, recent, in photography, 5
Proofs, over-printed, reduction of, by W. England, 251
Prumm, Herr, Th., Unter den Linden, Berlin, "At Home," 496
Pupil to a photographer, "By-the-Bye," 303
Putty, glazing without, 170
Pyrogallol for dry-plate development, a simple and expeditious method of preparing, by Professor T. E. Thorpe, F.R S., 9
——, dry, a dropping tube for, by James Jameson, 77
Pyrogallic and ferrous oxalate developers, comparison of, 217
—— acid, dangers of, by Dr. T. L. Phipson, 508
Pyroxyline, On solvents for, 61
——, the composition of, 147
Quinone and hydro-quinone, 590
Ragy, on frilling, 427
Rapid printing and aids thereto, on, by Walter B. Woodbury, 114
Reception room notes; on receiving the sitter and taking an order, by Mrs. E. H. Way, 391
——, by S. A. J., 391
——, by T. M. Laws, 403
——, by Focus Junr., 404
Repeating camera, a, 253
Residues and wastes, photographic; What is worth saving, and how I save it, by Selimo Bottone, 547
——, by Hadah, 548
Restrainers and gelatine plates, by H. A. H. Daniel, 16
Retouching for beginners, by Henry Morgan, 90
—— by artificial light, by Rudolph, 569
Reversal of the photographic image during development with ferrous oxalate, by H. Wilmer, 86
Reviews, 43, 127, 247, 363, 411, 484, 536
Revolutionary powers in photography, new, daylight emulsification, unlimited heat, by Dr. Kenyon, 53
Rhodes, B., Cash at time of sitting, and how I get it, 487
Ride, a day's—"Going away," by G. Bradforde, 466
—— "Coming home," by G. Bradforde, 478
Robinson, H. P., Landscape studies, 138, 210, 283, 330
Rocher, H., On the relation of photographers to the public and the public to photographers, 380
Rosse, Earl of, F.R.S., Notes on instantaneous shutters, 326
Roux, V. and S. Geoffray, The white opalescent precipate which often forms on gelatino-bromide plates, 357
Royal Academy notes, "By-the-Bye," 207
—— and photography, 266
Royal Cornwall Polytechnic Society, 434
Rudolph, Retouching by artificial light, 569
Rules, on making and regarding, 555
S. A. J., Reception room notes; on receiving a sitter and taking an order, 391
Salomon, M. Adam, in the Rue de la Faisanderie, Paris, "At Home," 195
Sawyer, Lyddell, On photography and art, 151
——, Dark room notes, 571
Schnauss, Dr. J., On a good tour, 376
Schurer, M. A., On an apparatus for washing prints, 407
"Scots Greys," a day with the, by G. Bradforde, 296
Season ticket holders, photographing, 436
Self-luminous photographs, by Dr. J. M. Eder, 139
Sending out proofs—what I do and why I do it, by Alex. Beeby, 451
——, by Mrs. E. H. Way, 451
Sensitive salts in emulsions, by J. Barker, 15
Sensitiveness of gelatine plates, reason of the, 302
—— emulsion, cause of, 398
—— of plates, increasing the, by free silver nitrate, by A. J. Brown, 605
Sensitometer, an improved, by J. D. Mucklow, F.I.C., F.C.S., and J. B. Spurge, 621
——, on, by Leon Warnerke, 92
Shaw, W. G., On French portraiture, 465
Shawcross, W., On how I retouch and varnish my gelatine negatives, 344
Sheffield Photographic Society, 35, 60, 178, 228, 347, 443, 503, 600
Shellac in gelatine emulsions, 279
Shoeburyness, at the School of Gunnery, "At Home," 291
Shutters, instantaneous, of various kinds, by Leon Vidal, 38
——, 445 469, 517
—— for landscapes, simple and certain, by R. B. Gilson, 521
Silver, how to recover it in its entirety from waste gelatino-bromide of silver emulsion, by A. J. Jarman, 83
——, the economy of, 169
—— bromide, action of light on, 533
—— chloride, action of the solar spectrum and chemical development of, by Dr. Eder and Capt. Pizzighelli, 428
—— emulsions, gelatino-bromide of, by G. Dawson, M.A., Ph.D., 81
—— Iodide, the development of, and halation, by Capt. Abney, R.E., F.R.S., 578
—— nitrate in gelatine emulsion, excess of, 326
—— paper, gelatine chloride of, by W. T. Wilkinson, 208
Silver pictures, the permanency of, 361
—— printing, on the use of alum in, 1
—— printing and toning, 518
—— residues, on the treatment of, by J. Sorrenson, State Architect, Brunswick, 333
—— salts, sensitiveness of, to light, 281
—— used up in different photographic processes, on the quantity of, by Dr. J. M. Eder, 513
Simpson, J. Hutchison, On the artistic element of photography, 219
Sitters, eccentric, 411
Smith, George, On condensers and front lenses for the optical lantern, 220
Societies, Proceedings of, 22, 35, 46, 69, 84, 96, 108, 118, 132, 144, 156, 167, 178, 191, 203, 215, 226, 238, 251, 262, 274, 287, 298, 311, 322, 335, 347, 359, 371, 383, 395, 407, 419, 431, 442, 455, 468, 479, 489, 503, 515, 527, 537, 551, 561, 574, 586, 599, 611, 624
Solar spectrum, action of the, and chemical development of silver chloride, by Dr. Eder, and Capt. Pizzighelli, 428
Soluble bromide in gelatine emulsion, by Capt. Abney, R.E., F.R.S., 198
Sorrensen, J., State Architect, Brunswick, On the treatment of silver residues, 333
South London Photographic Society, 22, 69 118, 178, 227, 274, 489, 512, 538, 586
Southward Ho! on Easter Monday, by a Special Correspondent, 187
Spectrum photography, an improvement in, 123
—— of comet 1881, preliminary note on the photographic, by William Huggins, D.C.L., LL.D., F.R.S, 357
Spence's metal and photo-engraving, 123
Spiller, John, F.C.S., On lens, or no lens, 247
Spots on carbon transparencies and prints, 566
Spurge, J. B., and J. D. Mucklow, An improved sensitometer, 621
Statham, Rev. F. F., M.A., On the value of photography as a critical agent, 64
Status of the photographer, "By-the-Bye," 40
Stephens, J. C. (Dunedin, N.Z.), Impedimenta for the field, 607
——, On glazing studios without putty, 163
Stereoscopic photography, Its application to the science of meteorology, by J. Harmer, 126
Stereoscope and panoramic slide, the portable, by W. Harding Warner, 165, 212
Stops, by Horace Wilmer, 367
Studios and the weather, 50
——, glazing without putty, by J. C. Stephens, 163
Substrata, by Capt. Abney, R.E., F.R.S., 352
Subterranean photography, by J. Streatfield Cox, 259
Suggestion, a, by Alexander Cowan, 569
Sunbeams, measuring the, 122, 134
Sunshine recorder, on a photographic, by Capt. Abney, R.E., F.R.S., 10
Swan's incandescent light, a photographic experiment with, 542
—— collection of photographs, Newcastle-upon-Tyne, the, 547
Swinton, A. A. Campbell, Hints on apparatus for dry-plate working, 214
Taking in the editor, "By-the-Bye," 328
Talbot, Fox, 109
Talk in the Studio, 12, 24, 36, 48, 60, 72, 96, 108, 144, 156, 168, 204, 216, 228, 239, 252, 264, 275, 288, 300, 312, 324, 336, 348, 359, 372, 384, 396, 408, 420, 432, 443, 455, 468, 480, 492, 504, 516, 528, 540, 552, 5t3, 576, 588, 600. 612, 624
Tannic acid as a preventive of frilling and blisters, on the use of, by E. Brightman, 21

Tasimeter as an actinometer, 195
Technical Exhibition Meeting, South London Photographic Society, 512
Telegraphic transmission of pictures, 175
Temperature, the effects of change of, on photographic lenses, 589
Theatre, an electricity-lit, 484
Thin images with the ferrous oxalate developer, an unsuspected cause of, by Capt. Abney, R.E., F.R.S., 255
Thorpe, Professor T. E., F.R.S., A simple and expeditious method of preparing pyrogallol for dry-plate development, 9
Thunderstorm, balloon trip in a, by W. Cobb, 295
Thursday Evenings for Photographers, Ashley's Hotel, 298, 311, 335, 347, 359, 371, 383, 395, 408, 419, 431, 442, 455, 468, 479, 491, 503, 515, 527, 540, 551, 561, 575, 587, 599, 612, 624
Tissue negatives from gelatine plates, by W. Bailey, 244
Toning bath, the carbonate of soda, by Charles West, 110
Tone, a good, by Dr. J. Schnauss, 376
Topics, 7, 20, 31, 42, 54, 79, 90, 102, 114, 126, 138, 151, 162, 174, 186, 198, 210, 247, 259, 271, 283, 295, 307, 319, 330, 343, 355, 367, 379, 391, 403, 415, 427, 451, 463, 475, 487, 499, 511, 523, 535, 548, 571, 595, 607, 618
Touching and retouching, by M. B. P., 164
Transparencies, a simple way of producing, by Robert Vincent, 230
——, by day and by night, making, 457
——, produced by luminous paint, by R. Vincent, 463
Transparent positives, a new method of taking, by Capt. Biny, 476
Tripods, on, "By-the-Bye," 543
Turnbull, J. M., On an improved method of washing gelatine emulsion, 189
Tyrian purple, 159
Valentine, W. D., Half-an-hour on photographic matters, 580
Vanity Fair, "By-the-Bye," 160
Varnish, the so-called crystallization of, by A. J. Brown, 620
Vidal, Leon, French Correspondence, 19, 51, 82, 104, 140, 152, 186, 222, 236, 259, 272, 280, 304, 331, 355, 389, 425, 452, 470, 500, 531, 557, 579, 593, 607, 614
——, Instantaneous shutters of various kinds, 38
Vienna, Herr Lowy in, the Lichtdruck process in detail, "At Home," 590
View negatives, enlarging with a home made apparatus, by H. J. Palmer, M.A., 524
Vignettes and vignetting, by G. Bradforde, 319
Viles, Edward, The lime light, 44, 52
Vincent, Robert, A simple way of producing transparencies, 230
——, Transparencies produced by luminous paint, 463
Vogel, Dr., Emulsion, 34
—— collodio-gelatine emulsion, by J. M'Ghie, Glasgow, 415
——, Dr. H. W., The action of the acid developer on highly sensitive bromide emulsion plates, 129
——, Out-door photography, 374
Voice, photographing vibrations of the, by C. Cuttriss, 321
Wane, Marshall, My dark room, 163
——, Mr. Marshall, in George Street, Edinburgh, "At Home," 340
Wanted, an operator, by Cliff, 475
Warnerke, M. Leon, At Silverhowe, Champion Hill, "At Home," 62
——, Sensitometers, 92
——, Two practical hints, 111
——, A new discovery regarding gelatine emulsion, 248
——, Improvement in the new method of manipulating gelatino-bromide, 310
——, new discovery, 217, 229
Warner, W. H., Stereoscope and panoramic slides, portable, 165, 212
——, Some experiences of dry plates, 489
Washing prints, an apparatus for, by M. A. Schurer, 401
Wastes, practical hints on saving silver and gold, by C. Cooper and Co., 449
—— and residues: what is worth saving, and how I save it, by Hadah, 548
Waterhouse, Major J., B.S.C., M. Garnier's new methods of photo-engraving, 523
Way, Mrs. Eliz. H., How I keep my books, 235
——, Reception room duties: on receiving the sitter and taking an order, 391
——, On "sending out proofs: what I do, and why I do it," 451
Weighing and measuring, 146
West, Charles, The carbonate of soda toning bath, 110
Wet collodion process, the, 90
White points on emulsion plates, 399
Wilkinson, W. T., Gelatino chloride of silver paper, 208
——, Reproduction of negatives for single transfer carbon printing, 485
Wilmer, H., On the reversal of the photographic image during development with ferrous oxalate, 86
—— at the Great Eastern Railway, "At Home," 171
——, On stops, 367
Window and Grove, Messrs., at Baker Street, "At Home," 124
Winter and Co., Vienna, On photographs on woven fabrics, 315
——, Enlargements upon canvas, "At Home," 555
With the camera on the Continent, "By-the-Bye," 352
Woods, C. R., Coloured transparencies from silver images, 621
Woodburytype process popularised, the, 109
Woodbury, Walter B., On rapid printing and aids thereto, 114
——, On electric light for photographic use 535
——, On balloon photography, 549, 560
Work and wages, "By-the-Bye," 268
Woven fabrics, photographs on, by Winter an Co., Vienna, 315
Yorkshire, West Riding, Photographic Society 36, 46, 203, 288
York, electric lighting at, 434
Young, James, Ammonium bromide—is the equivalent 98 the right one? 557

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1166.—*January* 7, 1881.

CONTENTS.

PAGE
On the Use of Alum in Silver Printing.................... 1
Modification of Emulsion Processes 1
At Home 2
Photography In and Out of the Studio.................... 4
Recent Progress in Photography 5
Notes 6
Topics of the Day.................... 7
Iodide and Ammonia in Gelatine Emulsions. By Capt. W. de W. Abney, R.E., F.R.S.................... 8

PAG
On a Simple and Expeditious Method of Preparing Pyrogallol for Dry-Plate Development. By Professor T. E. Thorpe, F.R.S....................
On a Photographic Sunshine Recorder. By Capt. W. de W. Abney, R.E., F.R.S.................... 10
The Melbourne International Exhibition. By J. W. Lindt ... 10
Correspondence 11
Talk in the Studio.................... 12
To Correspondents 12

ON THE USE OF ALUM IN SILVER PRINTING.

In a recent number of the News Mr. Paget asked whether alum would be useful to employ for eliminating the last traces of hyposulphite of soda from the print after the washing, and in a note we appended to his letter it was stated that the experiment had already been tried. The use of alum for this purpose is of ancient date, for if a reference be made to the Photographic Journal of 1856, it will be seen that Sir W. J. Newton, the distinguished painter, but, at the same time, an enthusiastic photographer, recommended it. The Rev. F. Hardwich, who was at that period a constant contributor to the Proceedings of the Photographic Society, and the chemist who did, perhaps, more than any man living to perfect the photographic processes then extant, examined the action of alum on hyposulphite. He found that it decomposed the hyposulphite in the same manner as an acid does, by combining with the soda and liberating hyposulphurous—or, more properly speaking, thio-sulphuric—acid, which in its turn passed into sulphurous acid and sulphur. The liberated sulphur, as one might naturally expect, tends to combine with the metallic silver, and to produce a darkening, acting, in fact, as a toning agent. He further went on to argue that it is better to remove the hyposulphite of soda by warm water than to decompose it and leave sulphur in the tissue of the paper. There is a very simple experiment which every one may try, which is to take a little common salt dissolved in albumen and water, and add nitrate of silver to it, which forms albuminate and chloride of silver as a white colloidal mass. This is thrown on a film and washed, and then treated with hyposulphite of soda, when it will be found to dissolve readily. The addition of a little solution of alum at first creates a turbidity through the liberation of sulphur, but gradually a darkened mass separates out, which by chemical tests can be shown to contain a sulphide of silver. If a print be badly washed, and hyposulphite of silver be left in it, the effect of the alum would, therefore, be to darken the whites. If the prints, on the other hand, be very carefully washed, and only a trace of hyposulphite of soda left, the effect of the alum would be to liberate a small quantity of sulphur, but it would be so little that it would be indistinguishable. It appears, then, that whether alum be used or not, in a well washed print only the same result would ensue, supposing hyposulphite of silver alone were dreaded.

The advantage of alum might possibly be to tell whether a print was well washed or not, and in this light it is to be recommended. It must not be forgotten, however, that it has been shown that even in a well washed print an organic compound of silver is frequently found which defies any amount of washing to eliminate, and it is this which most probably induces fading of the image. If it should prove that the alum can decompose this organic compound, and render it innocuous, the use of the alum bath would be a great boon to the photographic community. About the same period that Mr. Hardwich wrote, appeared a formula for mixing alum with hyposulphite for the fixing bath; the error in attempting to use such a mixture need scarcely be pointed out.

As is the case with gelatine plates, as much hyposulphite should at all events be washed out as possible before using alum. An oxidizing agent, such as peroxide of hydrogen, as recommended by Dr. Angus Smith, would be far preferable to alum, since the hyposulphite in that case would be oxidised to harmless compounds. The price of the peroxide is its great drawback, but no doubt if a demand arose for it, it would become considerably less costly than it is at present.

◆

MODIFICATION OF EMULSION PROCESSES.

The season is now at hand when the prudent photographer will endeavour to utilize the leisure that the winter's gloom places at his disposal, by making provision for the busy days which are expected to return with the finer weather of the coming spring.

Doubtless many a batch of dry plates will be prepared during the next few months, and stored away ready for use in summer, either in the professional studio, or on the holiday excursions of the amateur. Indeed, this provision for the future is rendered almost necessary on account of the extreme difficulty which attends the successful preparation of emulsions during hot weather. It may, therefore, reasonably be expected that, from the multitude who will now be working the various emulsion processes, there will be no lack of practical suggestions for the modification of the somewhat tedious routine so universally recommended at the present time.

We do not assume, for one moment, that advantageous departures from the beaten track are possible, neither should we advocate the utility of attempting new methods for the sake only of differing from those which experience has proved to be the best; but the success which has already attended many attempts to simplify and to shorten the different manipulations suggests the probability that, before long, many of the operations which have hitherto been looked upon as absolutely necessary to success, will be replaced by easier methods.

There are few who would not hail with delight any means of diminishing the length of time required for washing gelatine emulsion thoroughly, as well as of avoiding the somewhat troublesome details which must be attended to in order to perform even this most necessary operation with any amount of success; and we can but feel astonished that more should not have been induced to experiment with the idea (first suggested by Captain Abney) of washing the silver bromide previous to its incorporation with the gelatine.

Experience shows that by this means an emulsion can be obtained which, so far as its mechanical condition goes, is as perfect as could be desired; while it possesses the advantages both of obviating the necessity of a contact of silver nitrate with the gelatine, and, consequently, the chance of the formation of an organic compound of silver, as well as of being capable of being most perfectly washed, by the easy method of decantation, within the space of a few minutes.

It appears to be of importance, in this method, that the soluble bromide should be added to the silver nitrate solution, to which a small quantity of glycerine has been placed. Thus, during precipitation, the silver nitrate is continually in excess, and there is danger of the precipitation of other soluble compounds, owing to impurities in the soluble bromide. In this way sufficient oxide, or sub-bromide, might be formed to produce fog on development, and it is therefore recommended to add a little nitric acid before washing the bromide.

Notwithstanding the simplicity and ease of this method, it appears to be but little adopted; but it so strongly recommends itself to those who have experienced the troublesome process of washing gelatine emulsion, that it should at least receive a fair trial. There are, however, other means of simplifying the process of washing, such as the plan suggested by Dr. Van Monckhoven of decomposing silver carbonate by means of hydrobromic acid; which process requires considerable nicety of manipulation.

It is not improbable that other means than prolonged emulsification will be found for producing extreme sensitiveness; and it is impossible to over-estimate the advantage of such a modification, if we remember the serious evils which so often result from long cooking of the gelatine. Universal success, however, does not appear to have attended the addition of ammonia to the emulsion. Nevertheless, it is without doubt that increased sensitiveness may be obtained by such an addition.

It will be noticed, if a gelatino-bromide dry plate be partly wetted with dilute ammonia solution, and allowed to dry completely, that, on exposure to sunlight, darkening takes place much more quickly on the parts which were wetted than on the other parts of the plate. This would seem to prove that ammonia renders silver bromide less stable, and, consequently, more prone to decomposition by the action of sunlight.

Now, if an emulsion be prepared with a very large quantity of gelatine, the particles of silver will be so separated as to allow of their examination by means of transmitted light beneath a high power of the microscope. A comparison, by this means, of cooked and uncooked emulsion conclusively proves that cooking changes the coarse irregular particles of silver bromide into excessively fine particles, which are evenly distributed throughout the gelatine. If, now, a drop of ammonia solution be placed upon the film, and the action watched beneath the microscope, it will be seen that the first action is a solution of silver bromide together with some of the gelatine. As, however, some of the ammonia evaporates, the bromide is redeposited in a state of fine subdivision, and thus covers the plate with a new surface of freshly-precipitated silver bromide in a highly sensitive state, and possibly combined with ammonia.

It follows, as a consequence of this action, that it should be possible to increase the sensitiveness of a gelatino-bromide dry plate by flooding it with ammonia; and this we have found to be the case, although several precautions are necessary to ensure success.

It is a matter which experience alone can prove whether such a simple means will be found to replace prolonged cooking; but it is at least likely that many a batch of plates, which prove slower than could be desired, might be improved by this means; and we certainly recommend experiments to be made in this direction.

Probably the effect of adding ammonia to the emulsion is similar to that which has just been described; and, although the process has, as yet, but few followers, we are glad to see that very successful results are being obtained by those who are adopting this plan. Dr. Eder has proposed to make use of the ammonia-nitrate of silver for adding to the soluble bromide instead of the nitrate, and already several successful modifications of this idea have been made.

But besides these modifications in manipulation, there is also another question of no less importance, viz., the use of the other haloid salts in conjunction with the bromide. Opinions are so diverse upon this point, that it is still a matter of doubt, in many minds, whether the addition of iodide is beneficial or otherwise; but the facility with which the chloride is reduced in comparison with the bromide seems to point out that the addition of the latter is certainly not to be recommended.

Lastly, it must not be forgotten that, strong as may be the hold which gelatine has obtained amongst dry-plate photographers, there are other substances which have proved themselves capable of yielding important results; so that, while many will doubtless be following in the footsteps of Dr. Vogel's new process, there will still be left a wide field for experiment with other transparent colloids. But whether the coming season open out new paths or not, it is certain that, before long, there will be important modifications in those processes which are fast beginning to be regarded as stereotyped methods of working.

At Home.

AT MILLBANK.

It is a clear morning, but a sharp east wind is blowing over the parapet from the steely Thames, as our hansom carries us quickly along the Embankment. We pass the Abbey, Old Palace Yard, the tall and majestic Victoria Tower, the magnificent stone archway known as as the Peers' Entrance, and then, suddenly leaving all these fine buildings and grandeur behind us, enter the narrow street that leads to Millbank. Here we come out upon the river again, and the wind blows more chilly than ever; or is it that solemn fortress-looking building, that pile of grim brick and barred windows, that causes the shivering? There is little time for reflection, for cabby presently pulls up at a massive stone gate, beside a black doorway all studded with bars and bolts.

A big round knocker confronts us, for all the world like a heavy iron fetter, but our unsteady hand fails to raise it. "Try the bell, sir," says cabby; who coolly waits to see how we get on, and, in the hope, no doubt, that admission will be refused, speculates about the chance of a fare back. But he is doomed to disappointment. The door opens but slowly, and a little way only, it is true, but it opens sufficiently to show a warder in steel buttons and a shining chain with keys attached to his girdle; he takes the card we thrust into the yawning crevice, and reads it. The card is satisfactory, and in another moment we are standing in the lodge, and indulging in a weak joke about the difficulty of getting into prison. But we are not there yet. Another iron gate has to be unlocked—after the first has been carefully shut—and weare then at liberty to enter confinement.

The shape of Millbank prison is that of a star-fish, the centre being occupied by the Governor and various officers, and the radiating wings by the prisoners. We walk, unattended, along a silent and solemn avenue, to the central offices, the dull prison walls on either side, their embrasure-looking windows more like a fortress than ever; there is no noise, and not a soul is to be seen. But we pass by a warder presently, standing in a recess so quietly that he quite startles us, and then we go by two others, one of whom has a note-book in which he makes an entry. We ask our way to the Governor's office; a gesture, rather than words, is the reply we receive.

But once in the centre of the establishment, the aspect of affairs changes. You feel that chill wind no longer; there are green leaves and ivy to gaze upon, and dilute sunshine even; you pass through busy workshops and yards where men are at work and at exercise.

A cheerful office full of busy clerks is here, and comfortable furniture and a bright fire. There is a savoury smell of lunch about—of Irish stew, if we mistake not—which exerts quite an appetising effect. One begins to think that a prison is not such a bad place to live in, after all, for a short, a very short time, if—if—only they did not make such a bother about opening that big black door at the entrance. There is nothing unusual about anybody, now one grows accustomed to the scene. If it were not that the majority of the men were clad in a monotonous grey dress, and the minority wore a dark uniform with steel buttons and steel chains at their side, which have a metallic handcuff ring about them, one might easily mistake Millbank for some other government establishment, say Portsmouth Dockyard or the Arsenal at Woolwich.

Armed with the governor's authority, a guide now leads the way to the photographic studio in which we are interested. He, too, has a steel chain with a pass-key. Here is the glass-house—a little erection in a yard by itself. We enter. It is a model of neatness and cleanliness; in fact, we unhesitatingly say it is the brightest little studio we have seen in our experience of "At Homes." The floor is as white from scrubbing as the deck of a man-of-war; there is not a thing out of its place; not a piece of apparatus is awry or in disorder; not a speck of dirt is visible. Strips of clean carpet are laid in the gangway, and where the sitter is posed the floor is painted black.

What about the lighting? it will be asked. The lighting, we reply, fulfils the requirements of a model studio, as we heard them recently expressed at the establishment of Messrs. Hills and Saunders. A high wall at some distance from the studio that the sun cannot get over, so that there is little or no necessity for blinds, and the diffused light can be used as you find it. The Millbank studio is not lighted from the north, it is true, but there is plenty of illumination, and it may be employed without stint.

The photographer at Millbank is one of the steel-buttoned warders, and we congratulate him on his well-arranged studio. Here are some pictures he has just taken; half profile, bold, clear, and vigorous portraits, well lighted, and altogether unlike what prison photographs usually are. There is no 'prentice hand here, and we say so. In reply, our warder unbends his austere manner, and introduces himself as a former acquaintance. He is no other than Corporal Laffeaty, late of the Royal Engineers, an apt pupil of Captain Abney's, and one of the clever Sappers who took part in the Transit of Venus Expedition. The mystery is solved; no wonder the Millbank portraits have of late been so good.

A sitter is departing as we arrive, a man in ordinary attire, his short cut-away beard giving him the appearance of a foreigner. Our guide sees our look of astonishment: "He is a liberty man, and is photographed in liberty clothes; he goes out next week, and has therefore been permitted to grow a beard during the past three months," and on the desk we see a printed form referring to him, to which his photograph will presently be attached. "Seven years' penal servitude, three years' police supervision," we note is upon it. His crime was forgery.

What, we ask, if a man refuses to be photographed just before the expiration of his sentence? Our guide smiles: "it is a very simple matter; a man is usually set at liberty before his time, but only if he conforms to our regulations."

Our guide leaves us for a while, and Mr. Laffeaty asks if he shall go on with his work. We reply in the affirmative, and he quits the studio to fetch a sitter. He is not long gone, for there are plenty outside in the yard we have just crossed, men in grey ambling round the flagged area at a rapid pace at fixed distances from one another, and reminding you vividly of a go-as-you-please race at the Agricultural Hall. He is a young man of stalwart build, the sitter, when he appears, and he is as docile as a dog. He is clean shaven, and has an ugly black L on his sleeve, which means, poor fellow, that he is a "Lifer."

There is a wooden arm-chair for posing. "Look here, I want you to sit down like this," says our friend the photographer, placing himself sideways in the settle, so as to give a half profile. The convict does as he is told, and evidently enjoys the business immensely. "Don't throw the head back quite so much; there, that will do. Now put up your hands on your breast, so." For the shrewd governor, Captain Harvey, it seems, believes that a photograph of a man's hands is as important almost as that of his face.

The warder-photographer retires to coat his plate, and we are left for a moment alone with a "Lifer." Why shouldn't he make a rush for it, fell us to the earth, and have a try for liberty? He might be a murderer; that he had committed a terrible crime was certain from his sentence. Keep the camera between yourself and the man, and be ready to roar out lustily if he so much as move a muscle, was one precaution that occurred to us; or should we knock him down at once out of hand before he began any mischief at all?*

No such precautionary measures are called for. Indeed, it made one smile to think of such a thing as resistance. One might, perhaps, conjure up such thoughts as these in the presence of an imaginary convict; but the facts here are very common-place. On the arm chair opposite you sits a young man, almost a boy, with a frank, good-humoured face—a poor fellow who is evidently luxuriating in a delightful moment of release from drudging work and monotonous labour. Do what you want him to? Will he be obedient? Why, he would stand on his head to please you and to escape for a few minutes longer his daily toil. And as to bravado and ruffianism; there is just the same difference between the daring robber, and this grey-clad, humble individual, as there is between a fighting cock with his plumes and feathers, and a plucked fowl on the poulterer's counter.

Mr. Laffeaty comes back to the docile prisoner, focusses, gives an exposure of fifteen seconds, with a wet plate and No. 2B lens, and secures an admirable negative. "I have never had the least difficulty," he tells us, after he has taken back his charge, "either with the men or with the women. The men are apt to be too grave, the women are sometimes given to giggling; that is, perhaps, the only drawback I have to contend against. I never take any full-face portraits in the old style, and I think I have improved the photography itself of late. There was an article in the **News** called 'At Home at Scotland Yard' some months ago, and I have taken up several of the hints given there."

Mr. Laffeaty has to work very quickly at times, and, as a consequence, develops and fixes at once, without waiting to intensify. The latter operation he does in the light, with a few drops of sulphide of potassium in water, a method which, while ready and effective, does not appear to give too much hardness.

We cross the yard once more to make a call on the governor. The grey coats are still hard at it at their go-as-you-please race, except a few men who have fallen out, and standing still with their faces turned to the wall like naughty boys. They have an hour's exercise a day, and some of them seem to be trying to get double the amount out of the time.

---

* We hear afterwards that this convict was arraigned on a charge of murder; but a verdict of manslaugher only was returned. He stabbed a woman with a sharp pipe-stem, wounding her so grievously that she died in twenty minutes.

To Captain Harvey is, in a great measure, due the improvement in photography that has of late distinguished the Millbank establishment. He is good enough to show us several series of pictures. Here is Kurr, of turf swindling notoriety. This long face belongs to Paine, convicted the other day of poisoning a woman with drink, and who, it appears, was one of the men we just now saw exercising in the yard below. Here are the two Stauntons, connected with the Penge mystery, and other more or less well-known criminals. All these are "first convictions," who are confined by themselves, and bear a much better character from the warders than the "habitual criminal" class, for whose special behoof photographic portraiture has been provided. It is for the passer of counterfeit coin, the burglar, and the swindler—who have little interest for the public, but a great deal for the prison and police authorities—that criminal registers are required, to aid the suppression and detection of crime.

Once more outside the gate, the prospect seemed very open, and a group of workmen dawdling on the parapet by the river laughed heartily as we passed, because we had "just come out of Millbank."

The "At Home" next week will be "Mr. W. H. Midwinter at Park Street, Bristol."

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Coloured Photographs—The Photophone—The Paget Prize—Photographing Nebulæ.

Coloured Photographs.—Without entering into the merits or demerits of the pictures of the Colour-Photographic Company, which, we are told, are to revolutionize photography, and render the services of artists in oils and water-colours quite superfluous, it may be asked whether sufficient encouragement has been given to coloured work as a whole. It may be that the coldness with which artists, at one time, looked upon photography, has found its natural reaction in the jealousy and exclusive spirit shown towards coloured work in connection with the various photographic exhibitions. Or possibly the inferior quality of the work which until the last few years was the rule, has had its effect in bringing about a contempt for coloured photographs—a contempt, indeed, which many yet retain. There is no doubt some fearful monstrosities have been perpetrated in the way of photographs in oils and water-colours, but these have long since disappeared, since good artists have condescended to take up the colouring of photographs as a special study. It is quite right that proper prominence should be given to photography pure and simple, though the cry as to "touched" and "untouched" photographs is one that would scarcely be raised now-a-days. The "working-up" of a negative is now almost universally admitted as legitimate, and the only debateable point is how far this "working-up" may be carried—an extremely difficult matter to decide. But, so far as colours are concerned, the world knows well enough to what perfection photographic portraiture has attained, and it is casting no slur upon the art to claim that it should go hand in hand with colours. Photography has been made use of in a number of combinations in which the artist has united his skill to the accuracy of the lens. Many of these combinations, especially those where crayons play an important part—are exceedingly beautiful, and really rival the best work of this kind to be seen on the walls of the Academy, though, doubtless, they would be refused admission within the sacred circle, simply because what has been called (erroneously, in many instances) a "mechanical" process formed the basis of the picture. We see no reason why an attractive and instructive exhibition could not be got together entirely of coloured pictures in the production of which photography has played some part, no matter how unimportant. It is no use to delude oneself into the belief that the public prefer uncoloured photographs. As a matter of fact, the commonest question asked in a photographic studio is, "What will this cost to be coloured?" and photographers should take advantage of this taste by encouraging skilled artists to devote themselves as much as possible to the colouring of photographs. Unless from the reasons suggested above, it is difficult to understand why the slighting expression, "Oh, it is only a coloured photograph!" should ever have been used. It is true that artists have now begun to recognize the value of photography, and many first-rate men make use of it largely, although, curiously enough, they are very chary in acknowledging their indebtedness; but the expression has not yet wholly died away, and therefore all the more necessary, we hold, why the public should see what can be done in the way of coloured photographs.

The Photopone.—The wonders of which the telephone was the originator are evidently only in their infancy; and it is impossible to say what the researches in the latest and apparently inexhaustible field of science may not lead us to. Professor Bell has, since his arrival in London, pursued a series of experiments (commenced at M. Janssen's laboratory at Meudon) at the laboratory of the Royal Institution, and these have led to some remarkable results. The invention of the photophone, by which a beam of light sets up a molecular disturbance in a number of discs of selenium, suggested the idea that a sound could be produced by means of the telephone, and, if so, probably other substances besides selenium might produce a similar effect. A beam of sunlight passing through holes in a perforated disc was conveyed on a piece of selenium in circuit with the telephone. The rotation of the disc rendered the beam intermittent, and when a sufficient speed was given to the disc, a musical note was heard in the telephone. An attempt to hear the note by placing the selenium itself failed; but in the course of the experiments the hand was placed in the path of light to interrupt the musical note. For the hand was substituted a sheet of hard rubber, when the discovery was made that something passed through the rubber, and even through two pieces of rubber with a glass vessel of alum water between them. A thin sheet of selenium was then prepared, and the note was heard direct, but much inferior in volume to that produced by the rubber. The fact led to the discovery that all substances in the form of thin sheets will emit sound when acted upon by an intermittent beam of light, as they will also in the form of tubes. Since his arrival in Europe Professor Bell has experimented with many substances by placing them in test-tubes and connecting the open end to a hearing tube. When an intermittent beam of light is thrown upon the substance through the glass of the test-tube a musical note is heard—sometimes loud, sometimes soft. A cigar placed in the tube yielded quite a loud note; sulphate of copper in crystal gave "a very beautiful note;" but the best was obtained from some little chips of fine wood. At the Royal Institution, on the suggestion of Professor Tyndall, a few drops of sulphuric ether were placed at the bottom of the tube, when a distinctly audible, but feeble, musical tone was the result—a suggestive and significant fact, as it helps to prove the phenomenon to be due to molecular action, and that we can hear the molecular vibrations of a gas! What next?

Japanese Imitative Art.—A striking illustration of the wonderful capacity of native Japanese artists to produce exact copies of any work set before them has recently come under our notice. Professor E, Kinch, of the Government Agricultural College, Tokio, when leaving this country to accept the duties of his professorial appointment, took out with him a cabinet portrait (by Messrs. G. and R. Lavis, of Eastbourne) of a scientific friend well known in the county of Essex, and, by way of compliment to his friend, gave the said portrait to a native Japanese artist, with instructions to produce a life-size enlargement painted upon silk in monochrome. The result has just now been shown to us, and so correctly is the likeness preserved, with every detail exactly copied by hand, that the reproduction appears to be a veritable photo-enlargement. So close is the resemblance in texture and style to a true photograph, that most observers unhesitatingly pronounce it to be a camera picture, and yet we know by actual statement that the portrait is simply the work of a faithful copyist. The silk is strained upon a wooden panel measuring eighteen by twenty-four inches.

Photographing Nebulæ.—A new field of astronomical research is opened up by the successful attempt of Dr. Draper to take a photograph of the bright part in the nebulæ of Orion. The exposure was fifty minutes, and it is stated the mottled appearance of the vast sheet of glowing gases was well represented. Nebulæ are very numerous all over the midnight sky in both hemispheres, and in order to get a thorough knowledge of them, it will be necessary to keep taking successive photographs, for these worlds in embryo are always altering in form and brightness. Moreover, the glimmer from them is ordinarily so feeble, that it will require the most limpidly clear nights to give successful results. M. Janssen has, we believe, already commenced the work, and, no doubt, his example will be imitated at most of the Observatories.

◆

RECENT PROGRESS IN PHOTOGRAPHY.

[*From* The Times.]

"Another revolutionary power in photography," is the heading of an advertisement which appears in some of our weekly technical journals, and it is this revolutionary power to which we propose to refer, in the first place premising that the exclusive right of its exercise does not appertain to the individual who thus attracts the attention of that portion of the public who are interested in photography. As a matter of history, it may be as well to mention that several years ago Dr. Maddox obtained sensitive photographic plates by emulsifying bromide of silver in liquid gelatine, coating glass plates with the product, and then drying the film. He was subsequently followed by Mr. Burgess; but not till Mr. Kennett's process was published was anything practicable for the use of the general public made known. But, notwithstanding Mr. Kennett's fostering care, the gelatino-bromide process—as it was incorrectly called—did not make much way, since it appeared to possess but few advantages and several disadvantages when compared with the old collodion processes with the nitrate of silver bath, or the newer ones in which bromide of silver was suspended in collodion.

Some two years ago the whole photographic world was startled by the announcement that Mr. C. Bennett could obtain pictures in the camera in but a fraction of the time necessary with any process extant up to that time, and he demonstrated the fact to the satisfaction of every one. The process he used was founded on that of Dr. Maddox, and consisted of bromide of silver in a state of minute subdivision held in suspension in a viscous solution of gelatine. The rapidity was gained by keeping the gelatine containing the suspended matter in a liquid condition for several days, the molecular state of the sensitive compound being altered by the prolonged liquefaction. Some idea of the exquisite sensibility of bromide of silver can be gathered from the fact that M. Stas, the great Belgian chemist, while making his classical researches on the atomic weight of bromide, found one particular form of this compound which was speedily blackened by the feeblest yellow light—a light which, as a rule, is totally inoperative to cause the slightest change in bromide of silver. To revert, however, to Mr. Bennett's process. It was, indeed, a new power placed in the hands of photographers, and it need scarcely be said that portraitists were not long in adapting it to the requirements of the studio, or, perhaps, to speak more correctly, to adapt the studio to the requirements of the process. Many of our readers must remember the often painfully lengthy pose—perhaps a minute—required from them in the dull days of winter in order to produce a passable likeness. Such a sitting was by the new power reduced to 1-6th of the length. Eminent experimentalists on the science side at once grappled with the subject, and by their researches the time of preparation is reduced from days to hours, and increased rapidity is attained; indeed, to such a degree that in some cases a photograph can be taken in from 1-30th to 1-60th of the time of the old collodion wet process. To these newer plates, then, it is no misnomer to couple the term revolutionary power, and there is no doubt that a revolution in some branches of photography has taken place. Photography has known, however, greater revolutions than this—revolutions, indeed, which involved a complete change in the manipulations. Thus calotype, or the waxed paper process, with its development by means of silver, superseded the Daguerreotype, in which the image was developed by mercury vapour; and, again, calotype, in which the foundation was paper, was ousted from its position by Archer's collodion process, in which the paper picture gave way to transparent glass and a substratum of collodion. The Daguerreotype, it will be recollected, was a picture which was impressed on a metallic silvered plate, and which admitted of no reproduction in the commercial sense of the word, though it was and is still a glorious work of art, so delicate and rich in detail that nothing can surpass it for beauty. It was not then surprising that any process was hailed which enabled prints to be made from what is technically called a negative picture, and calotype fulfilled this condition. When Archer introduced the collodion process, however, its superiority in rapidity and in the beauty of the prints produced from its negatives, at once gave it a place which it held till two years ago. The latter have none of the grain of the paper, which in small pictures marred the fidelity of detail, and, though not so exquisitely delicate as the Daguerreotype, yet it was a wonderful stride towards perfection. In fact, the collodion processes by the wet or dry methods rendered photography capable of holding the place among our national industries which it now holds. It has now a co-partner, but not a rival, in the gelatine emulsion process.

In the recent photographic exhibition in Pall Mall we saw examples of the rapidity of which the gelatine process is capable. A train going 60 miles an hour was fairly expressed on the photographic plate, there being a sharpness of image which was truly marvellous. The 1-150th part of a second is a short interval of time, yet in such a time the picture was taken. Again, one of the pictorial series of interest of the year was a series of views on the river Thames by Mr. Mayland. The silent highway is sparkling with motion, shipping and steamers at full speed being rendered sharply and clearly—in fact, the idea of motion is conveyed by the foaming tracks and curling waves which they make in their passage.

Drawing-room photography by amateurs now becomes a possibility and a practicability which before it was not, and in one remarkable picture of the year we have a dark interior of a room, and the portrait of a charming model secured on one plate in 25 seconds of time. In the old days such a combination would have been impossible, except by printing from two or more negatives. Mr. H. P. Robinson, whose artistic work is so well known and so greatly admired, has thus scored a success in adapting the process to his peculiar style of pictures. In science, however, the rapid plates have proved of more than yeoman service.

One of the most marvellous feats, however, of photography is the portrayal of the motion of trotting, cantering, and galloping horses by Mr. Muybridge, in America, in which he shows changes in the position of every limb during minute fractions of a second, and thus settles certain points which have long exercised the minds of certain eminent physiologists.

If we quit the more rapid process and come once more back to the old collodion process, we find that it has also done good service in scientific research. In the Bakerian Lecture of the Royal Society for the past year, Captain Abney has shown how the sensitive compound bromide of silver can be so modified as to cause radiations of very low wave-length to impress themselves on the photographic plate, and in a map he gives the Fraunhoffer lines which exist in the solar spectrum far down below the visible red rays of the spectrum. In the prints as usually supplied, the images, which are built up of minute particles of silver, gradually fade and become worthless.

The simplification of the Woodburytype process, and of printing in printing-ink from gelatine surfaces, is still making progress, as evinced by the number of specimens of each which we see in books of travels, or of transactions of antiquarian and learned societies.

Notes.

With the New Year we revert once more to the plan of placing the Index at the beginning of the paper, so that the News in its original form is again before its readers. The series of articles under the title "At Home" will be continued during the year, the more famous studios of the provinces, and of the capitals of Europe, coming in for a due share of attention.

On the 28th inst. will appear the first of a series of articles, written in a light chatty vein, under the title "By the Bye," touching on topics of particular interest. "The Status of the Photographer" will commence the series.

A tube of thick glass, in form and figure like a plain lamp chimney, constitutes the body of an emulsion syringe exhibited by Mr. Henderson at the Photographic Club on Wednesday, December 29th; and a piece of plated copper gauze, having about ten meshes to the linear inch, covers one end of this tube. The set emulsion being now placed in the tube, a wooden plunger serves to force it through the wire netting.

We secured some pictures of the Eclipse on Friday last, on gelatine plates, and if they prove nothing else, the results demonstrate very clearly that gelatine emulsion is quite unsuitable for astronomical work. Our pictures were secured in an ordinary camera, with a rectilinear lens, the exposure being something like one-hundredth of a second with the smallest stop available.

The image of the sun was two-tenths of an inch in diameter, and under the microscope furnished an excellent illustration of the eclipse phenomenon. But the toad skin markings of the rugged film became painfully apparent under a high power; and in this respect gelatine is as far inferior to collodion as collodion is to the Daguerreotype plate. Another circumstance is worthy of remark; the reduced silver particles were finer in the case of oxalate development than when pyrogallic was employed.

The employment of soluble silicate as a preliminary coating for gelatine plates is becoming more general, and is said to be one of the most effective preventives against frilling. Herr Schaarwächter, of Berlin, employs it also for the Vogel emulsion, and he tells us it is immaterial whether the silicate of soda or potash is used.

Herr Schaarwächter, however, employs the silicate in admixture with white of egg. His formula is the following:—

Soluble silicate	1 part
Solution of albumen	5 parts

the albumen solution being prepared by mixing the white of one egg beaten to snow with three pints of water. One must be careful to purchase genuine silicate.

Since Mr. Henderson's 'cute idea to employ phosphorescent sulphide of calcium in admixture with emulsion, photographers are likely to take particular interest in this luminous compound. We see that Mr. Crookes points out that if exposed to damp air, the sulphide gives off sulphuretted hydrogen, and is liable to slight deterioration.

The death is announced of Dr. John Stenhouse, F.R.S., on the last day of the old year; he was until recently a vice-president of the Chemical Society, and to him photographers owe much of the knowledge they possess on the subject of pyrogallic acid, Dr. Stenhouse's researches upon that compound having been of a most elaborate and exhaustive character.

"Charles Dickens reading to his daughters at Gadshill," a photograph issued as a Christmas illustration to *Life*, is likely to be historical, since it is the first photographic picture—employing the term in contradistinction to simple portraits or studies—that has appeared in any periodical. It will not be long before we have illustrated journals publishing such pictures in their ordinary weekly issues.

Dr. Vogel writes us from Berlin: "My emulsion troubles are now all over, and next week you shall have my emulsion in England." We are glad to hear it, for while Paris, Vienna, and Berlin, seem to have had no difficulty in obtaining supplies of the Vogel emulsion, London has been left out in the cold.

A theatrical anecdote. A friend induced Charles Mathews to attend at a studio to be photographed. "Well, did he come?" said the friend in question, walking into the studio some days after. The photographer shook his head. "He promised me faithfully—the first thing on Monday morning," he said. Again the photographer expressed disappointment. "I only had one sitter on Monday, I remember perfectly well, and here is the negative"; he held up the picture of a head very narrow at the top, and bald and white, with sharp little eyes, like a pouter pigeon. "Why, that is Charles Mathews!" cried the visitor. The photographer, like most other people, only knew the comedian in the brown wig with the ambrosial curl in which he usually appeared in public.

Another one. Mr. Toole promised to give a sitting somewhere in Regent Street; he had forgotten the address, but fortunately remembered the process was called by a "type." "You take your portraits by the ha-ha-hum-type, I believe," he said, entering a likely establishment. "Oh, yes, Mr. Toole; it is very good of you to come to us; we have been anticipating a visit for a long time." The portraits were made, and copies sent to the theatre; so good were they, indeed, that Mr. Toole did not fail to congratulate his friend when he called. But, curiously enough, the latter got quite hipped. "You have never been near our place," he cried. "Yes, I have," returned the comedian, "and here is the word 'type,' on the portraits, exactly as you told me." The photographer only waxed the more wrath. "Good heavens! why they are all types; I told you plainly the *what-d'ye-call-em-type*, and you've been and gone instead to the *thingemy-gig-type*."

Topics of the Day.

INTERIORS.

BY GEO. BRADFORDE.

"We can't get along without interiors!" quoth Russet, as he strapped up his ten by twelve camera, after stowing away the lenses wrapped round by the Chamois leather in the interior of said camera, thereby giving ocular demonstration of what he said. We had likewise just indulged in a most substantial breakfast, so it was not a great stretch of imagination on my part to agree with him. "Churches are always good!" was his next original remark, as he tried the weight of the camera and the strength of the straps at the the same time. "Whenever I get hardup, I fly to the church for succour!" There was a queer twinkle in his eye as he said this. "There I always find relief! People seem to think you are really deserving of their support, if you can manage to photograph their pew, or show up in grand style the rail at which they were confirmed or married, or let them have a good shillingsworth of their baptismal font—the font never fails!"

I was a good deal shocked at the mercenary spirit displayed by Russet at the time; but now—looking back the matter of fifteen years—I can admire the worldly wisdom of his remarks. A "Second Daniel Come to Judgment" could not have delivered himself more pithily, or to the point.

It was the interior of Old Jarrow Church on the Tyne side that we were to photograph. It was the first job of the kind I ever had to do, and consequently I felt greatly interested in the proceedings. When we got to the place, the first thing we looked to was to find a convenient hole to use as a dark-room. This we found in a great dungeon underneath the ruins of the priory; the gardener's wife had been utilizing it as a hen house for some years, so there was no danger of damaging any of the fixtures with our chemicals. Here we planted our bath, sorted our developer, &c., and arranged a pail with water for the washing. We next went and focused the altar-piece, with St. Bude's chair brought forth from its corner so as to show up conspicuously in front. I can remember the style of lens we used, although I cannot give you the name. It was a short dumpy thing, with a great clumsy diaphragm that fitted in front, and the focussing was done by means of a spiral worm that wound round a tube fixed to the flange. I have only seen another of the same kind, and it was to be had for ten shillings in a shop in Farringdon Road. Russet declared that the image on the ground glass was "sharp as a needle, and clear as crystal," while I, myself, could hardly descern the faintest outline. "It will only take an hour's exposure!" exclaimed Russet, as I backed up the plate with wet blotting-paper. An hour! And the bright sunlight streaming through the pictured windows and lighting up every corner—the altar-piece—the nave—the transepts—the groined roof. An hour! And with a rectilinear or a symmetrical Ross or Dallmeyer, and a gelatine plate, I would get the same result in twenty seconds!

The hour's exposure at length slipped away, and we rushed to the dungeon to develop it; Russet slammed the huge door, and held up a great cloth against the edges so as to exclude every particle of light during the time that I was developing. We had a penny "dip" stuck in a bottle in a far corner of the dungeon, just to let me see what I was doing. With a great dash of the developer, I commenced operations, and in a very short time I could see by means of the candle that we had got a very good picture. "You may open the door now, Mr. Russet," I exclaimed, as I washed the negative with a small jug, laving water upon it from the pail. But Russet did not open the door, for the simple reason that he could not: the knob had been removed from the inside, and we were literally prisoners. We tried everything we could think upon to force that awful door: we tried to pick the lock with our toothpicks—we tried to force it off with an old nail that we found on the floor—we picked up a huge stone from the floor, and took turn about in shying it wildly and insanely at it; but it defied our efforts.

"Hi!" yelled Russet, as he frantically hammered on the iron lock with a fragment of stone. "This is a precious fix, ain't it Geo.? Why the deuce don't you shout? Hi—Hi! Some one must come some time! Hi, hi!"

It was eleven o'clock when we were locked in, and in spite of the "Hi—hi" of Russet, and the fearful clatter that he made, no one came near us by four o'clock. The "dip" burnt down, and we were in total darkness.

"Ain't this horrible, Geo.?" quoth Russet, as he took a brief rest between hammering on the door and shouting like a lunatic.

"We can't get along without interiors," I muttered, as I gloomily let my head sink upon my knees. I have reason to think that my good angel prompted me to lower my head at this moment, for as sure as I write this topic, had it remained in the same place, the stone that Russet had in his hand would have hurt me. He did not mean it, I dare say, but he was a good deal vexed, you see. At five o'clock the gardener's wife came to let in the fowls, and she let out the fools.

Our greatest troubles in the palmy days of collodion were the long exposures at the above work. Plates, thoroughly clean, were like angels' visits, few and far between; while plates that got dry during the exposure, and allowed the developer to leave great tidal marks that made the patient worker wax wroth, and plates that got covered by those villainous matt silver stains that seemed to have no prevention or cure, and consequently sent the worker frantic, were as plentiful as plums in a pudding. Ah! work in dark places of worship was no joke, and anything but a pleasure in those days, and I am afraid a great amount of unclerical language was used upon those occasions that ought not to have been. Yet there was some excuse for a little temper. Just think about sitting watching the slow working apparatus for an hour in an empty, hollow-sounding cathedral—a solemn place, that when you spoke made the voice sound like some one else; then, when you nervously shifted your feet, the echoes sounded like the approach of Pharoah and his host. Then, to think that, perhaps, all your patience would go for nothing, because of an objectionable stain or two that *would* appear where the most delicate details had to show. No wonder if we thought of Job!

We tried lump sugar in our developer, and thought for a space that we had overcome the demon; then we tried an old and very acid bath. This required a still longer exposure; but still we for a time fancied that he was floored again. Then we thoroughly drained the plates that came from a new bath, and were once more inclined to shout victory; but, in despite of everything, and at the most provoking and unreasonable moments—when all would be going well, and pleasant smiles shone round us, up would jump the old fellow lively as ever, in the shape of a negative covered with stains. Then that plate would be smashed, and naughty words be spoken, and "chaos would come again."

The first real shock that the demons that haunted the interiors got was when the rapid lenses were introduced. From one hour's exposure the time was reduced to twenty or five-and-twenty minutes. It was a hard smack at them, but they were only subdued by it, not conquered; if the manipulator was not careful as to the dusting and well draining of his plate, and to attend to the wet pad of blotting-paper at the back, they were on the watch, and at once took advantage of his carelessness to give him a plate covered with smudges; opaque streaks reared themselves like steeples from the drainings, and all over was a complete milky way of comets and pinholes.

It remained for the dry plates to give the final *coup-de-*

main to our tormentors. Then, and not till then, those demons went forth into space howling, and photographers rejoiced. The five-and-twenty minutes were now reduced to two and a-half or five, according to the rapidity of the plates used. Still, in some churches, where the windows are all painted, you will require, even with a *very* rapid gelatine plate, fifteen or even twenty minutes; for you must remember the green and yellow colours of those gorgeous and dazzling pictures are non-actinic, although they appear so bright to the eye. I merely mention this, as one is apt to forget that such is the case; but even were the exposure a week instead of an hour, as in Russet's time, those stains would never more trouble us—*they* are routed for ever—their death knell has rung!

There is not so much talent required in the actual photographing of an interior (of course there must be the keen eye to fix the hour for the best effects) as there is judgment in dodging the negative when obtained, and in the printing of it. It is very rare indeed that we meet with an interior that does not require some little thing done to it before printing that improves the result, and almost every one, in the printing, demands the blocking out of some part where the light falls too strong, or comes with a rush through some inaccessible window. I shall try to explain myself more plainly, and shall take for illustration this palatial staircase.

Observe the dark, richly-carved furniture of the hall on either side; the bronze figures that hold in their silent grasp the twenty jets that flood the visitor with light at night; the arching of black marble on either side! Broad and noble it all looks, and breathing of riches. Behold the white marble steps with their snake-like stripe of dark green Turkey carpet; the short black pillars on either side, with their coping of tri-coloured marble; then the niche above, with its pure alabaster ornaments, and its dazzling background of white marble; and, over all, behold the light streaming down upon all from a cupola on the top. A picture rich and grand, and pleasing to the eye, but a most difficult one to obtain a good photograph of.

The dark furniture and shaded parts to right and left at the foot: the pillars, dark green stair carpet, and bronze figures; the white background, marble steps, and alabaster ornaments. There is the picture before you: and to do it properly you would require three distinct exposures to do justice to the three distinct parts—a thing impossible, as yet, in photography. Our only plan here is to give the full exposure to the deep shadows, expose enough to show all the detail, without having recourse to redevelopment, and then rectify the results in dodging the negative and in printing. Thus, I obtained a good, clean, rich 15 by 12; but, as I had known from the first, the white marble and alabaster were frightfully over-exposed, the dark parts, although showing every detail, were painfully thin, while the middle part was a little dense, but nearer the mark.

Now, what more simple than printing off this negative? In the first place, we start with the thin part, the shadows on each side of the steps. After the negative had set with its usual coating of varnish, I coated the thin parts on the glass side with a strong solution of iodine and varnish. When this was set, with a pen-knife I scraped neatly round the edge of the part I required denser; then I covered it again with a mask of papier mineral, whereon I worked with the pencil the high lights and other little places that I thought required my help. The middle parts I judiciously covered during the printing with a cut mask; and last of all, for the denser parts, I had to cut a final mask, and print for two hours longer than the rest of the negative.

If we got one good print off the negative in a day, it fully repaid us, for the result was truly gratifying.

Even with the easy work, now-a-days, for interiors, the negatives will still have to be "dodged" in printing; we will still have the blocking out of skies; we will still have the deep shadows to brighten, and the too strong lights to subdue. By-the-bye, a very simple plan of taking away the objectionable glare from one of those lights is to cover the rest with your handkerchief after laying the print on a sheet of glass, and give it a flash or two in the sun. If cleverly done, the effect is astonishing.

Those who wish to succeed in "interiors" should, without a doubt, learn as many "dodges" in printing as they possibly can.

The "Topic" for next week will be "The Prolonged Use of the Alum Bath," by Valentine Blanchard.

IODIDE AND AMMONIA IN GELATINE EMULSIONS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

In the last number of the "Bulletin of Belgium Photographic Association," I find the following paragraph, by Dr. Eder, amongst some interesting remarks that he makes; and as a translation of it has appeared in one of the weekly journals, I have thought it right to criticize what I find in it. He says, "I do not at all see the use of employing iodide of silver in gelatino-bromide. I find that iodide is always much less sensitive than bromide. Bolton, Davanne, Vogel, Stillman, and others, have shown that iodide of silver with alkaline development is scarcely at all sensitive. So in gelatino-bromide of silver, it diminishes the sensitiveness. If to gelatino-bromide be added a quarter to a half of iodide of silver, the plates in studio work become much less sensitive, and the negatives are feebler than with pure bromide of silver. Even the addition of one-twelfth of iodide diminishes considerably the sensitiveness of an emulsion. An emulsion of iodo-bromide of silver with one-twelfth of iodide boiled for half-an-hour is not much more rapid than an insensitive emulsion of simple bromide of silver unmodified and scarcely boiled. Moreover, these plates develop more slowly. The advantage they possess in giving clearness in the shadows, and of being capable of development in a well-lighted dark room, does not compensate sufficiently, in my opinion, for the loss of sensitiveness. And I hold as an enormous advantage the great sensitiveness of pure bromide of silver to different colours—an advantage which should never be given up. The ideal of a photographic plate would be to have the greatest possible sensitiveness towards the red extremity of the spectrum (red, yellow, and green). This plate would give the effects of natural light, and the play of light and shade would be rendered in the photograph much as it appears to the human eye. Of all the productions at present known, bromide of silver, pure and modified, most nearly approaches this ideal.

"I consider as even more unfavourable than the addition of iodide of silver, the use of chloro-bromide of silver. We see springing up on all sides recipes for chloro-iodo-bromide emulsions. I would strongly protest against all these absurdities. Chloride of silver is reduced with infinitely more ease and rapidity than bromide. It is also tolerably sensitive to light, and receives equally the latent image during the time of exposure necessary to bromide of silver. The strong developer necessary for bromide is, however, much too forcible for chloride. Chloride of silver blackens completely throughout before the bromide is reduced in the lights. Hence there is always fog in chloro-bromide plates, unless there be added to the developer sufficient bromide of potassium to transform to bromide of silver all the chloride, and thus cause an irregular reduction."

The subjects in this paragraph to which I propose to confine my remarks to-night are the use of iodide and chloride with bromide of silver in a gelatine emulsion. First, as to the iodide; I am not going to quarrel with Dr. Eder as to whether the iodide is less sensitive than the bromide. We must look on it in two aspects: one in which it alters the physical aspect of the film in which it is used; and the second, in regard to the chemical aspect. Now, where alkaline development is used, the iodide is so much inert salt in the film. Supposing (as I always do suppose, and most rigidly cling to) that the iodide, bromide, and chloride of silver, are reduced to the form of a sub-salt of silver, it may, however, be well to glance briefly at the action that iodide may have.

Supposing iodine is set free after exposure, what becomes of it? and also the bromine, what becomes of it? Iodides of the alkalies will displace bromine in the bromides of silver, as we are all aware, but iodine will not displace bromine but, on the contrary, bromine will displace iodine, apparently, till they are in the proportion of their molecular weights. If, then, we have bromine and iodine liberated by the action of light, the bromine will attack the particles of iodide in its immediate neighbourhood, and we have a double quantity of iodine set free. In other words, we have all iodine liberated instead of bromine. At first sight it might seem that double work was here done, so that there was a loss of energy; but a little consideration will show that this is not the case. The only loss of energy which can be taken into account is the difference of the affinities of gelatine for iodine, and of gelatine for bromine. Iodine has a greater affinity for gelatine than has bromine, so that as regards loss of energy, and consequent sensitiveness in this respect, the mixture of iodide has the advantage. It remains, however, to consider, when we may expect that a mixture of iodide with bromide will act prejudicially. This will be when the number of particles of iodide acted upon by light (and which are undevelopable, and consequently a cause of diminution in sensitiveness) bear such a proport on to the particles of bromide that the increased affinity of iodine over bromine for gelatine is more than counterbalanced. The exact theoretical figures are very difficult to give, but I should say that if a surface contains one-tenth of iodide to one of bromide, the sensitiveness would remain the same as when none was used; whilst with one-twentieth there should be a small increase. Now as regards the physical state of the silver: I have shown, at all events to my own satisfaction, that the addition of iodide acts as a restrainer to fog, and is, of course, not the least a destroyer of the image. In other words, it means that you can use more ammonia and less bromide when developing it. It will be in the recollection of my hearers that in the albumen-beer process, I developed the image with strong ammonia and pyrogallic acid, and with no restrainer whatever beyond the physical restraint caused by the albumen and the iodide. It may be said, the albumen alone played the part; but that is not the case; if with a collodio-bromide emulsion you see the same preservative in a simlar manner, the use of a bromide in the developer becomes a necessity. Again, it has been urged against the use of iodide, that rays of low refrangibility (such as the yellow rays) have no effect, and that, therefore, sensibility must be diminished. I would just ask what is the meaning of its being sensitive to these rays? It means that the molecular state of the bromide is changed, causing it to absorb these rays more in proportion than those of higher refrangibility. It has been too much the custom, since Dr. Monckhoven's paper, to state that a certain colour of emulsion gave the most sensitive plates, and that colour is one which tends to give sensitiveness into the red. I am not at all of that opinion. My own researches, which have been recently published by the Royal Society, tell me that a molecular state which may be very sensitive comparatively to the red and ultra red rays, may be rather insensitive for the blue rays, and my belief from experiment is, that the blue tint which is so much a markedly desideratum according to most authorities, is not so sensitive as one in which a yellow tint can be traced, and this is the tint which is got by the use of iodide with the bromide when prepared by the method I have published, and which many other workers have used. Regarding the desirability of getting an emulsion which is equally sensitive to all rays, I leave this question for a future paper.

---

* Read before the Photographic Society of Great Britain.

In connection with silver iodide in a gelatine emulsion there is another point to which I must allude, viz., its effect on the keeping qualities of the plates prepared with it. Colonel Stuart Wortley tells us that with him the plates do not keep, and that a general decomposition takes place over the plate productive of fog. Mr. R. Manners Gordon says that with iodide he always gets green fog if he uses as much as 1 grain per ounce of emulsion, which is about 7 grains of iodide to 120 of bromide. Let me for a minute examine this subject; 1st, as to the effect on the keeping qualities; 2nd, as to general decomposition; and 3rd, green fog. I think Colonel Wortley has been excessively unfortunate with his experience in this respect. Besides the letters which publicly appeared from Mr. England and others, I have received several, all giving the same account, viz., that the plates keep admirably. I have kept plates months, both before and after exposure, without any deterioration in quality. Is there any reason why iodide should not keep? I think not. It is a much more stable salt than the bromide, and is almost perfectly unamenable to organic reducing agencies. Thus, alkaline development will hardly, if at all, touch it. It may, I admit, when it has free contact with the air, become insensitive, but this, I opine, is due to the impurities to be found in the atmosphere, and when protected against that, as it is in a gelatine film, it will remain as sensitive as it originally was. The cause of deterioration in bath plates was no doubt due to the presence of free silver in the film; but when gelatine was used, as in Dr. Hill Norris's plates, the films even then were kept for a long time in a highly sensitive state. This same argument applies to a general decomposition of the film, and a tendency to red fog. I cannot myself see any reason why iodide should cause fog if it remains unreduced, and I may further state that I have never found it so. Now, as to the green fog of which Mr. Gordon speaks. I can conscientiously say that iodide is not principally to blame for it. In a series of experiments I made, I found that pure bromide films would give it with certain gelatines when the alkaline developer was used, but that with the ferrous oxalate developer I have *never met with it*. This shows its origin. It is a real dye produced by the alkaline pyrogallate. With most gelatines, whether iodide be present or not, the fog is absent, unless the development be pushed. My humble advice to the members, notwithstanding these serious charges which are brought against it, is stick to the iodide, as theoretically it cannot be hurtful except the dose be overdone, and it is of the greatest comfort, in that floods of light may be used in developing and preparing the plates.

As to the use of chloride, there is much to be said for a moderate use of it. Dr. Eder perhaps thinks that a wholesale quantity is used. Development might be modified to suit even that, as I have done myself. The use of a chloride, as far as I know, is to allow a full dose of silver to be used to convert all the bromide present in the emulsion without jeopardizing it by an introduction of free silver. Bromide displaces chlorine in the chloride of silver, when the bromine is in form of a bromide of the alkalies, hence the addition of a certain amount of chloride is useful, even with ordinary development. There is no doubt that a gelatine emulsion is quickened by using enough silver to convert all the bromide, and hence sensitiveness is increased. I must enter a protest against calling bromo-iodide emulsion an absurdity, and even can see nothing very ridiculous in the chlor-iodo-bromide emulsion, provided always that in the latter the chloride is in minute quantities, or that the developer is so modified as to act both on the chloride and also on the bromide of silver.

ON A SIMPLE AND EXPEDITIOUS METHOD OF PREPARING PYROGALLOL FOR DRY-PLATE DEVELOPMENT.

BY PROFESSOR T. E. THORPE, F.R.S., YORKSHIRE COLLEGE LEEDS.*

Pyrogallol or pyrogallic acid is made, as the latter name implies, by heating gallic acid, but the process as usually conducted is very uneconomical, on account of the difficulty of preventing the decomposition of the pyrogallol into metagallic acid. According to the equation,

$$\overset{\text{Gallic acid.}}{C_7H_6O_5} = \overset{\text{Pyrogallol.}}{C_6H_6O_3} + \overset{\text{Carbon dioxide.}}{CO_2}$$

gallic acid should yield eighty per cent. of its weight of pyrogallol, but the amount usually obtained is very much less than this; on the average, not more than thirty per cent. is formed. The greatest yield is given at a temperature of from 185° to 200° C. If the heat is allowed to rise to 250° the gallic acid is converted into metagallic acid, carbon dioxide, and water; thus:—

$$\overset{\text{Gallic acid}}{C_7H_6O_5} = \overset{\text{Metagallic acid}}{C_6H_4O_2} + \overset{\text{Carbon dioxide}}{CO_2} + \overset{\text{Water}}{H_2O}$$

The difficulties attending the conversion of gallic acid into pyrogallol have their natural effect on the price of the latter article. Photographers may be interested, therefore, in knowing how they may be able to prepare their own pyrogallol from gallic acid by a very simple and sufficiently expeditious process.

Ten grams (say 150 grains) of dry gallic acid, and 30 c.c. (say one fluid ounce), of glycerine (preferably Price's), are placed in a 2-oz. flask or wide test-tube, and heated on a sand-tray to a temperature of from 190° to 200°, so long as bubbles of carbon dioxide are seen to be formed in the liquid. The gallic acid readily dissolves, and in a very short time it is entirely converted into the theoretical quantity of pyrogallol: this fact has been verified by direct observations made in my laboratory. The brown viscous liquid, after cooling, is diluted with 1000 c.c. (say 34 oz.) of water. A solution is thus obtained, each ½ oz. of which contains rather more than 1½ grains of pyrogallol, sufficient, therefore, for developing a ¼ plate according to Mr. Swan's instructions. In containing glycerine it of course resembles Mr. B. J. Edwards' solution, which has found favour with many photographers.

---

* Read before the Photographic Society of Great Britain.

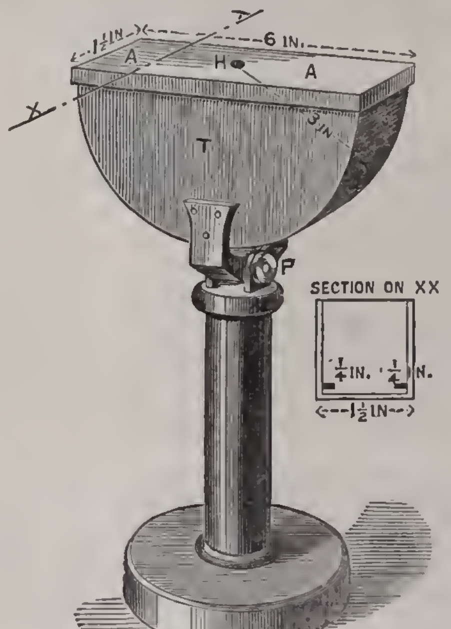
I have developed a number of plates (mostly Swan's) with solutions of pyrogallol procured in this way, with results in nowise different from those obtained by the use of a pure aqueous solution of crystallised pyrogallol of equal strength. The method of conversion is very easy; the only point to be attended to is the temperature, which should not be allowed to exceed 200°, otherwise the glycerine becomes very brown in colour. The thermometer should be supported in the flask or tube by a cork, perforated, of course, to allow of the escape of the carbon dioxide; and the bulb should be surrounded by the liquid, which should be shaken from time to time. The solution may, however, be very dark-coloured without sensibly staining the film, provided, of course, that the time of development be not unduly prolonged; a remark which applies equally to the ordinary method of developing by means of the crystallised acid.

As the present price of pyrogallol is about seven times that of gallic acid, the above process may be worthy of the attention of photographers who practise alkaline development.

◆

ON A PHOTOGRAPHIC SUNSHINE RECORDER.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*



There has been a good deal of talk lately regarding the registration of sunshine, and, up to the present time, as far as I know, the methods adopted have been founded on Campbell's plan of collecting the rays from the sun when shining, and focussing them by means of a glass ball on to either a hemispherical bowl of wood or else on a strip of paper. When the sun shone bright enough, the wood or the paper was charred, the sun making a track of its own. The plan I bring before you to-night is, to my own mind, much simpler, at all events for photographers, and I have therefore thought it suitable to bring before the Photographic Society. The instrument, in its simplest form, consists of a semi-cylindrical box, T, with a lid A, which cuts the cylinder as it were in half. At the spot where the centre lies, a small hole, H, of about one-tenth of an inch in diameter, is pierced. On each side of the curve of the cylinder runs a groove, and in these grooves a strip of sensitive paper is slipped by taking off the lid; the instrument is then ready for work. To place it in position is an easy enough matter. On a window-sill—or in any convenient place facing south—the instrument is placed, and by means of a compass or sundial (which can be easily made) the length of the lid is caused to lie east and west. This position once ascertained, the instrument can always be placed in true position as regards this adjustment. The other adjustment is to make the plane passing through the hole in the lid and the centre line of the paper to pass through the direction of the sun. To effect this, the box (which, from the figure, will be seen is affixed to a hinge on a stand, so as to turn at right angles to its length) should be caused to cast a shadow on a piece of white paper placed behind it, and be gradually turned on the hinge till the shadow of the lid is just cut off by the box itself. When this is so, the sun, the hole, and the central line of the centre of the paper, are evidently in the same plane, and the track will be made on the paper. I produce a sun-tracing made by this means. The above is the simplest form. By the expenditure of an extra sixpence an ordinary spectacle lens may be fitted to it, as is the case with the one shown. The aperture of the lens should not be more than one-fifth of an inch or thereabouts, as if more, the paper might become discoloured by diffused light. As in the example shown, a further modification may be made by using two holes, by which means the full benefit of the sunlight is utilized till sunset. Each hole will make a track of its own, which will overlap in parts, but which, where they do so, indicate the same sunshine, so long as the centre of each hole lies on the axis of the cylinder. One track will not begin till the sun is well over the horizon, and will continue till sunset; the other track will commence at sunrise and finish in the afternoon. Two small lenses, with a length of focus equal to the radius of the cylinder, may be used instead of the two open holes. Another method of using this sunshine recorder is to test the relative intensities of the different parts of the spectrum of the sunlight. This is accomplished by altering the lid of the semi-cylinder so that it forms an angle with the plane of the ends of the cylinder, and attaching to the lens or hole a prism of say 60°, and allowing the light issuing through the hole to be dispersed at right angles to the length of the paper. By this plan the spectrum would be registered; and if the paper be slightly darkened in advance, not only the actinic parts would be measured, but also the red end would imprint itself there, forming a perfect registration of the components of sunshine. There are some other applications of this little instrument, which you see in the model form, which might be usefully made. I have to apologize for the want of shapeliness of the instrument: but even in its very rough state it is capable of doing what I require. May I hope that photographers will aid meteorology by recording sunshine in different parts of the country?

I forgot to add two points; one is that the scale of hours can be printed on the paper itself before it is inserted in the instrument. A piece of glass is covered with non-actinic varnish; this is scratched through at proper intervals, and figured in hours, corrections for each week or month being made as in dialling. These lines are printed on the paper by diffused light, and the line showing 12 o'clock is placed in the centre of the cylinder; by this means the times when the sun is shining are shown. The second point is that the prints have only to be fixed by hyposulphite and washed. The paper may be what is called the ready sensitized, which will keep for months, and which, if a little discoloured, will not signify for this purpose.

◆

THE MELBOURNE INTERNATIONAL EXHIBITION.

BY J. W. LINDT.

A few weeks ago, I wrote sending you a few remarks under the heading, "Photography at the Melbourne International Exhibition, 1880."* Presuming that a little information on this subject is welcome, I shall continue my epistle to-day.

I may commence by telling you that Mr. Stephen Thomson, whom you no doubt know as an author and photographer of ability, has come to Melbourne and settled amongst us. As his reputation as an art-critic became known, our leading journals were glad to avail themselves of his services to write their reports on certain portions of the Fine Arts Departments of our Exhibition, and as photography is, I believe, included in his sphere of action, I shall leave any criticism to him, and he will no doubt send you his report on photography as it appears in our leading paper, the *Melbourne Argus*. You must just take this communication as though we chatted about our Exhibition in your own sanctum, and by no means as a formal report, for I am just jotting down things as they occur to me whilst writing.

---

* Read before the Photographic Society of Great Britain.

* These have, unfortunately, not come to hand.—Ed. P.N.

The speculation to go in as a licenced photographer to the Exhibition has so far proved a failure; the outlay occasioned amounted to nearly a hundred pounds sterling, and as yet there is very little chance to see any of it back. The inadequate space allotted us for the sale of photographs, and the out-of-the-way position of the stalls, account a good deal for the poor returns. In fact, the aggregate of money taken by three photographers at their stalls in five weeks is under five pounds. I hope it may come better as time goes on, but the ignorance and party-spirit of some of our commissioners have done a great deal of harm, and the work that might be done by one or two photographers in their spare time, has now four competitors, and I am sufficiently disheartened to take mine to order only. We protested against the admission of more photographers in vain, and the accompanying *Argus* reports will give you an idea how we were treated. Here, as elsewhere, the mistake has been made for each county and each court to exhibit their sculpture and their photography among the bulk of other exhibits, instead of having rooms set apart, which might again be sub-divided into courts for sculpture and photography; and I think I may say that the room containing the collections of many countries would have proved one of the chief attractions of the show. Not many of the leading English photographers have sent examples of their work, and some of their pictures have only just now been unpacked. This leads us to hope more yet will come to light before the Exhibition is over.

Nesbitt, of Bournemouth, came too late to find room in the Art Gallery, but he received a place in one of the passages near the offices of the Victorian Court, and, I think, all the more notice will be taken of his work on account of his isolated (photographically speaking) position. Vernon Heath also came too late for wall space, but having a revolving stand a place was readily made for most of his pictures. The only drawback of the stand is, that it allows one to come too near to the pictures, which is no advantage with enlarged work. Col. Stuart Wortley's pictures were earlier unpacked, and hence found wall space. The finest instantaneous sea views are, without a doubt, in the Ceylon Court, photographed by Mr. Skeene, of Colombo, I believe. Two of his views are positively startling; being taken towards evening, the sun appears about 35° above the horizon, surrounded by a mysterious looking ring or halo, and in the reflection cast upon the rippling water there appears about mid-distance a Malay prow with its square sail sharply defined against the horizon. Altogether this picture is a bold piece of photography, and perhaps Mr. Skeene will tell us some day how it was done.

Close to it is another remarkably lighted Cingalese landscape, with some figures of natives in the foreground; the sun also shows in this picture. It is impossible to tell whether double printing has been had recourse to in these pictures, but even if such is the case, their *tout ensemble* bear testimony of a bold photographic spirit, and an ardent lover of nature. The composition in Mr. Skeene's landscapes is, perhaps, sometimes at fault from an artistic point of view, but the atmosphere, the separation of distances, and also the technical treatment, are perfect, and the subjects always interesting.

Taking a general look round, I find hosts of photographs, framed and unframed, in all the courts, but many of them old stagers, which are, no doubt, interesting subjects, but as photographs and artistic productions do not rank very high.

New Zealand shows well to the front in good portraiture. Wrigglesworth, Bartlett, Clifford, Morris, and others, show very fine cabinets, and I am glad to notice the mania of *over*-retouching has not yet found disciples among them.

New South Wales has a large photographic display. Mr. Boyd is especially noticeable for quantity and size of work. Hubert Newman sends some fine portraits, unsurpassed from a photographic point of view, and his examples of enlarged portraits in carbon are first-class. I miss David Scott's work here, but I suppose he is getting tired of competition, and well able to rest on his laurels. His photography is especially good, and for many years I looked up to his work in admiration.

Queensland sends Daintree's characteristic enlarged and oil-coloured photographs, the same as were so well spoken of at Philadelphia.

South Australia sends—like all the other colonies—fair examples of photographic work, but nothing very remarkably advanced. The United States as yet show only photographs by Tuttle and Co., formerly of San Francisco—excellent photographs of actors and actresses, but woefully over-retouched, which gives the whole collection a family resemblance. A great portion of the American exhibits went down in the ill-fated vessel, "Eric the Red," and, no doubt, some of the work of their best photographers was among the goods thus lost.

Now, in conclusion, a word or two about gelatine plates. After the first packet that came into my hands, I had the conviction that in the course of a few years, collodion and bath would gradually come in for a second place. And now, after working gelatine plates for nearly a year almost exclusively, I am of the same opinion still But mind, they did not always go smoothly, and many an anxious hour my friend and neighbour, Mr. Foster (of Foster and Martin, 27 and 29, Collins Street, E.) and I would sit comparing notes about the behaviour of So-and-So's plates, and their respective developer, as compared with others', until our wives, perhaps becoming alarmed at our excited state of mind, forcibly changed the subject by commencing to play some of our favourite pieces on the piano, or inviting us to tune our fiddles and join in one of Haydn's trios.

What a boon gelatine plates must be to your London photographers! A dozen or more good brands to choose from, and the makers only too happy to give every information! It has been stated in the News that gelatine plates were comparatively more capable of rendering subjects in weak light than collodion. This proves fallacious in my experience, and, as you cannot pile up a gelatine negative as you can a collodion one, on a substratum, I consider that, in this particular respect, collodion has the advantage. I will close for to-day. Next month I shall resume the subject, and hope to be able to report more favourably with regard to the aspect of the Exhibition to the licensed photographer.

Melbourne, 10*th November*.

Correspondence.

THE APPEAL FOR AID.

Dear Sir,—It is almost beyond my power to express the deep gratification and honour I feel at being connected with a profession which has shown such fine generosity and manly sympathy for a distressed brother worker, as chronicled in your pages, week by week, under the above heading.

No less than *eighteen* benevolent individuals—the sum total—did I count last week, that, too, in the most heart-softening and purse-string-loosening season of all the year. The growth of the *fund* had, indeed, been great for a man who has always freely given and spread the results of his researches in photography Like the lookers-on at a street entertainment, the profession take all that is given them, and then, when the hat is passed round, steal softly away.

In no other pursuit in existence, I firmly believe, would such a lack of kindly spirit for a man who has suffered by an adverse turn of fortune have appeared. The dramatic, musical, and even pugilistic professions, would have come much quicker to the aid of a distressed brother.

It is a painful picture shadowed forth—that of a man in the direst necessity, appealing to benevolent photographers, only to find that, colder than the summit of Mr. England's snow-hooded peaks, is the charity of the profession it has been his delight, in former days, to work for.—Yours truly, Charles King.

14, *William Street, Grapes Hill, Norwich.*

MOONLIGHT PHOTOGRAPHY.

Dear Sir,—Permit us, through your columns, to thank Mr. W. K. Burton for his prompt reply to our query. Under the very favourable conditions he names in your last issue, we should certainly have thought that a good moonlight negative could have been secured in less time than was required for ours; but the facts prove so strangely contrary, that we can now only imagine Mr. Burton had not been so fortunate as we in his selection of the night for the purpose. We took advantage of the exceptionally brilliant full moon of last October; our subject was a stone-fronted house, the lens one of Lerebour's portrait combinations; the dry plate one of our own make (not more than twenty times the rapidity of wet), and we consider that the real exposure was effected in about twenty-five minutes, seeing that the moon became clouded over during the last five minutes of exposure; but having decided, after a previous experiment, to give the plate half-an-hour, we did so, and the result was a successful negative. A Woodburytype print of the view will be published in our "Photo Pocket Almanac," with a full description of the conditions under which it was taken, and we shall then have pleasure in forwarding a copy to Mr. Burton, and also, if you please, to yourself; the announcement of it to the general profession will be found in your advertisement pages. Perhaps Mr. Burton will kindly send us a print from his negative, so that we shall be able to compare notes.—We are, dear sir, yours faithfully,

D. H. Cussons and Co.

ON THE SENSITIVENESS OF PHOTOGRAPHIC FILMS.

Sir,—In your valuable Year-Book, I find an error in my article under the above-mentioned title, arising, I presume, from the translation, which I beg to correct.

On page 135 of the Year-Book it is said: "A wet bromo-iodized film shows the highest sensitiveness for the same region (by line G in indigo), but has also *considerable* sensitiveness for the blue and green of the spectrum." It should be *perceptible* instead of considerable; in fact, the sensitiveness of a wet bromo-iodized film for blue and green rays is not considerable at all.—Respectfully yours,

Dr. H. W. Vogel.

◆

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, January 11th, at the Gallery, 5, Pall Mall East, when, besides other matters, a paper "On the Lime Light," by Mr. Edward Viles, will be read.

Mr. John Thomas Towson died on the 3rd inst., at Liverpool. Mr. Towson, who was highly esteemed in scientific circles at Liverpool, distinguished himself in the early days of photography by the satisfactory solution of several knotty problems, although the following account from "Men of the Time" must obviously be taken *cum grano salis*:—"He was the first to direct the attention of photographers to the fact that the luminous and chemical foci were not of the same length, a knowledge of which fact at a later period enabled Dr. Draper, of New York, to take the first photograph from life. He was also the first to devise the means of taking a photographic picture on glass, and the use of the reflecting camera."

The *Athenæum* says:—"Daguerre, the discoverer of the photographic process which bears his name, which he reported to the world in January, 1839, was photographed by Mr. Mayall in 1846. This interesting portrait has been printed in Woodburytype, and forms the frontispiece of the Year-Book of Photography for this year."

Moonlight Photographs.—Messrs. D. H. Cussons & Co. have favoured us with a photograph taken "by the light of the moon" at 9 p.m., with an exposure of half an hour, a French portrait lens being used with open aperture. The result is interesting as the doings of a rapid gelatine plate, but it possesses, as might be expected, little value as a pictorial production; it is a villa, the white blinds reflecting the moonlight supplying the high lights.

New Light-Measurer.—M. Dufour has described an apparatus for indicating the variations of chemical intensity of sunlight. It has some likeness to Draper's tithonometer. The principle is, opposing the variable action of light, on a mixture of chlorine and hydrogen, with an electric current (of variable intensity, and measurable each instant), which, by its passage, causes decomposition of a quantity of hydrochloric acid equal to that produced by action of the light on the mixture of chlorine and hydrogen. The apparatus is like a Rumford differential thermometer; in one bulb is some hydrochloric-acid solution with carbon electrodes, in the other some sulphuric acid. The light acts on the former. One mode of measurement is to note the time taken in displacement of the sulphuric acid column a certain distance along the connecting tube. Then bring back the column to its original position by passing the current.—*Nature.*

A Few Photographic Reflections.—From the "Year-Book of Photography" just published, we gather that the improvements in the art during the past year have been of the most positive character. By the new gelatine process, which is so rapid that it may be said to literally "take" people unawares, *sitting* for one's portrait has become quite a pleasant incub—we mean occupation. People who, like vaccination in certain cases, do not "take well," will certainly "take" to this new form of proceeding; while the likenesses of those who have an apparently unconquerable aversion to being photographed may be secured *no-lens vo-lens.—Funny Folks.*

◆

To Correspondents.

Hypo.—1. You might have a better chance of success if you were to immerse the plates entirely in a much weaker solution of potassium cyanide. It is a matter of importance that you should make use of the pure salt, and not the usual commercial article, as this latter frequently contains an enormous proportion of carbonate of potassium. 2. By means of the crude sulphide of potassium.

Transfer.—It is a matter of some importance to make use of pure bees'-wax; and, moreover, it takes a considerable time to thoroughly imbrue the surface of the glass with the wax. Hence it frequently happens that the first prints stripped from a sheet of glass are spoiled from partial adhesion.

D. W.—See Correspondence in our last number.

S. Cholerton.—Try the experiment again under more favourable conditions of light, and let us see the result.

Collodion.—The film is too close and horny in its texture, and it is probable that matters may be put right by the addition of three or four drops of water to each ounce of collodion.

H. W. A.—Carbon prints on glass make admirable lantern slides, and you cannot do better than to adopt the process in question. There is no fear of the films becoming detached by the heat of the lantern, provided that a suitable substratum is made use of. A weak solution of gelatine containing a little potassium bichromate makes one of the best substrata. After the plates have been coated, a short exposure to light is necessary, in order to make the film insoluble.

W. W.—We do not usually give legal advice; but having had an opportunity of putting your case to a barrister over the dinner table, we give you the benefit of his ideas. If you deliberately pose a model with the view of obtaining an imitation of a painting, and the resemblance is near, you may be infringing copyright. In such a case intention or motive and the degree of similarity would be the most important factors.

J. B. Sanson.—Every photograph is the copyright of the producer or of the person who employs another to produce it; and before copying any picture you should obtain permission. Registration is merely a means by which the rights vested in any particular picture are recorded.

Portable Symmetrical.—The lens you first name is by far the best for your purpose.

W. H. M.—Unless you are working on a tolerably large scale, it will scarcely pay you to precipitate the silver from old hypo which has served to fix gelatine negatives. You cannot, however, use anything better than the solution of liver of sulphur.

Henri E. Husson.—It is extremely likely that extraneous light found its way into your camera or dark room, as it is difficult to imagine that the plate could have been fogged by over-exposure. If you follow Capt. Abney's directions exactly, we have no doubt that you will succeed well as regards intensification. Fifteen shillings per annum, or 3s. 10d. per quarter.

A. S. T. wishes to know what probability there is of a young woman obtaining employment as a retoucher, and on what terms instruction or practice can be had. We presume that she has some notions as regards the use of a pencil. Will our readers give some information regarding the matter in question? A. S. T. can in the meantime keep an eye on our advertising columns, where offers of instruction may frequently be found.

I. A. M.—Even if we knew how much the gentleman in question paid for his apparatus, we could hardly tell you; but you may easily obtain estimates from Siemen Brothers, the Brush Company, or other firms. Unless, however, you are prepared to spend at least as much as £300, you had better not entertain the idea.

Opinion.—The ordinary tissue is not at all suitable. An article on the subject will appear in an early issue.

F. Morton.—He is already engaged on a second edition now, but it will necessarily be a few months before it is issued; you will find what you want, however, on page 35 in the present edition of "Gelatine Emulsion," and page 44. Abney's "Instruction" costs 2s. 8½d. by post.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1167.—*January* 14, 1881.

CONTENTS.

	PAGE
The Latest Methods for Producing Photo-Tracings in Black and Colour	13
The Optical Lantern	14
At Home	14
On the Sensitive Salts in Emulsions. By J. Barker	15
Gelatine Plates and Restrainers. By H. A. H. Daniel	16
Photography In and Out of the Studio	17
Notes	18
French Correspondence	19
Topics of the Day	20
Iodide and Ammonia in Gelatine Emulsions. By Capt. W. de W. Abney, R.E., F.R.S.	20
On the Use of Tannic Acid as a Preventive of Frilling and Blisters. By Edward Brightman	21
Correspondence	21
Proceedings of Societies	22
Talk in the Studio	24
To Correspondents	24

THE LATEST METHODS FOR PRODUCING PHOTO-TRACINGS IN BLACK AND COLOUR.

Two new processes for taking photo-tracings in black and colour have recently been published—*Nigrography* and *Anthrakotype*—both of which represent a real advance in photographic art. By these two processes we are enabled for the first time to accomplish the rapid production of positive copies in black of plans and other line drawings. Each of these new methods has its own sphere of action; both, therefore, should deserve equally descriptive notices

For large plans, drawn with lines of even breadth, and showing no gradated lines, or such as shade into grey, the process styled "nigrography," invented by Itterheim, of Vienna, and patented both in Germany and Austria, will be found best adapted. The base of this process is a solution of gum, with which large sheets of paper can be more readily coated than with one of gelatine; it is, therefore, very suitable for the preparation of tracings of the largest size. The paper used must be the best drawing paper, thoroughly sized, and on this the solution, consisting of 25 parts of gum-arabic dissolved in 100 parts of water, to which are added 7 parts of potassium bichromate and 1 part of alcohol, is spread with a broad flat brush. It is then dried, and if placed in a cool dark place, will keep good for a long time. When used, it is placed under the plan to be reproduced, and exposed to diffused light for from five to ten minutes—that is to say, to about 14° of Vogel's photometer; it is then removed, and placed for twenty minutes in cold water, in order to wash out all the chromated gum which has not been affected by light. By pressing between two sheets of blotting-paper the water is then got rid of, and if the exposure has been correctly judged, the drawing will appear as dull lines on a shiny ground. After the paper has been completely dried, it is ready for the black colour. This consists of 5 parts of shellac, 100 parts of alcohol, and 15 parts of finely-powdered vine-black. A sponge is used to distribute the colour over the paper, and the latter is then laid in a two to three per cent. bath of sulphuric acid, where it must remain until the black colour can be easily removed by means of a stiff brush. All the lines of the drawing will then appear in black on a white ground. These nigrographic tracings are very fine, but they only appear in complete perfection when the lines of the original drawing are perfectly opaque. Half-tone lines, or the marks of a red pencil on the original, are not reproduced in the nigrographic copy.

"Anthrakotype" is a kind of dusting-on process. It was invented by Dr. Sobacchi, in the year 1879, and has been lately more fully described by Captain Pizzighelli. This process—called also *Photanthratography*—is founded on the property of chromated gelatine which has not been acted on by light to swell up in lukewarm water, and to become tacky, so that, in this condition, it can retain powdered colour which has been dusted on it. Wherever, however, the chromated gelatine has been acted on by light, the surface becomes horny, undergoes no change in warm water, and loses all sign of tackiness. In this process, absolute opacity in the lines of the original drawing is by no means necessary, for it reproduces grey half-tone lines just as well as it does black ones. Pencil drawings can also be copied, and in this lies one great advantage of the process over other photo-tracing methods, for, to a certain extent, even half-tones can be produced.

For the paper for anthrakotype, an ordinary strong well-sized paper must be selected. This must be coated with a gelatine solution (gelatine 1, water 30 parts) either by floating the paper on the solution, or by flowing the solution over the paper. In the latter case, the paper is softened by soaking in water, is then pressed on to a glass plate placed in a horizontal position, the edges are turned up, and the gelatine solution is poured into the trough thus formed. To sensitize the paper, it is dipped for a couple of minutes in a solution of potassium bichromate (1 in 25), then taken out and dried in the dark.

The paper is now placed beneath the drawing in a copying-frame, and exposed for several minutes to the light; it is afterwards laid in cold water in order to remove all excess of chromate. A copy of the original drawing now exists in relief on the swollen gelatine, and, in order to make this relief sticky, the paper is next dipped for a short time in water, at a temperature of about 28° or 30° C. It is then laid on a smooth glass plate, superficially dried by means of blotting-paper, and lamp-black or soot evenly dusted on over the whole surface by means of a fine sieve. Although lamp-black is so inexpensive, and so easily obtained, as material it answers the present purpose better than any other black colouring substance. If now the colour be evenly distributed with a broad brush, the whole surface of the paper will appear to be thoroughly black. In order to fix the colour on the tacky parts of the gelatine, the paper must next be dried by artificial heat—say by placing it near a stove—and this has the advantage of still further increasing the stickiness of the gelatine in the parts which have not been acted upon by light, so that the colouring matter adheres even more firmly to the gelatine. When the paper is thoroughly dry, place it in water, and let it be played on by a strong jet; this removes all the colour from the parts which have been exposed to the light, and so develops the picture. By a little gentle friction with a wet sponge, the development will be materially promoted.

A highly interesting peculiarity of this anthrakotype process is the fact that a copy, though it may have been incorrectly exposed, can still be saved. For instance, if the image does not seem to be vigorous enough, it can be intensified in the simplest way; it is only necessary to soak the paper afresh, then dust on more colour, &c., &c.; in short, repeat the developing process as above described. In difficult cases the dusting-on may be repeated five or six times, till at last the desired intensity is obtained.

By this process, therefore, we get a positive copy of a positive original in black lines on a white ground. Of course, any other colouring material in a state of powder may be used instead of soot, and then a coloured drawing on a white ground is obtained. Very pretty variations of the process may be made by using gold or silver paper, and dusting-on with different colours; or a picture may be taken in gold-bronze powder on a white ground. In this way coloured drawings may be taken on a gold or a silver ground, and very bright photo-tracings will be the result. Some examples of this kind that have been sent us from Vienna are exceedingly beautiful.

Summing up the respective advantages of the two processes we have above described, we may say that "nigrography" is best adapted for copying drawings of a large size; the copies can with difficulty be distinguished from good *autograph*, and they do not possess the bad quality of gelatine papers, the tendency to roll up and crack. Drawings, however, which have shadow or gradated lines cannot be well produced by this process; in such cases, it is better to adopt "anthrakotype," with which good results will be obtained.

THE OPTICAL LANTERN.

THE magic lantern has now ceased to be a mere toy, it having not only taken an honourable place among that apparatus which is to be found in the laboratory of the working physicist, but it is also very essential to the demonstrating physicist or the scientific lecturer.

To the photographer the lantern is an instrument of especial value, as it gives to him almost the only existing means of exhibiting his work to a large assembly of people; but there is at the present time an unfortunate tendency to sacrifice excellence to cheapness in the construction of the instrument, and this is much to be regretted, as at the present time the optical lantern is perhaps entering on a new sphere of usefulness as an aid to popular education and scientific demonstration. Condensers of inferior quality are too often made to serve, while "good enough for the lantern," is usually the verdict on any quarter-plate or carte objective which is totally unfit for any purpose whatever. In addition to this, it is by no means rare for a blow-through jet to be so ill-constructed as to waste fully one-half of the oxygen consumed; while even with a blow-through jet of the best construction it is easy to so far mismanage matters as to obtain only one-third of the light which ought to result. Another circumstance which much tends to mar many lantern exhibitions is the unequal density of the various slides; a light which is suitable for one—say, an unusually dense picture, being altogether in excess of that required to do justice to a thin slide made with an especial view for exhibition by a comparatively weak light. This difficulty presses with a heavy hand on that operator who is expected to exhibit any slides which may be handed up to him; some of these being over-dense, and others unduly thin or feeble.

Having now pointed out some of the difficulties of the situation, it becomes necessary to consider how far lantern exhibitions may be improved—or, at any rate, as far as the photographic aspect of the case is concerned. In the cases in point, there is rarely a very great necessity for a double or dissolving lantern, and there can be no doubt as to the advisability of selecting a good single lantern, rather than an inferior bi-unial; while Mr. J. Thomson's ingenious method* of arranging the slides so as to form an endless band, obviates those unpleasant gaps which often mar single lantern exhibitions. It is to be desired that the blow-through jet should be replaced by the more satisfactory mixed gas arrangement and hard limes, especially as there is no more danger with the latter burner, provided that separate bags are employed and reasonable precautions are attended to. The first essential of a good light, which should be capable of doing justice to the densest slides likely to be met with, being thus fulfilled, it becomes easy to meet the case of thin pictures by taking care that the lantern objective is fitted with Waterhouse diaphragms, and inserting that stop which is considered suitable for the picture to be shown. Condensers require rather better optical work than is sometimes put on them, and the lime light jet should be so adjusted that the image formed by the condensing lenses coincides as nearly as possible to the diaphragm of the objective; this latter being already placed approximately in that position which it is to occupy during the exhibition. The objective should be a portrait lens of the very highest quality, as any deficiency in this instrument becomes very much more apparent when it is used for lantern purposes, than when it is made to serve as a photographic lens. One of our leading London opticians has recently introduced a high-class special lantern lens, and we hope that his effort to raise the standard of excellence in connection with the lantern will be seconded by a general endeavour on the part of photographers to encourage the improvement rather than the degradation of the demonstrating or optical lantern.

At Home.

MR. W. H. MIDWINTER AT PARK STREET, BRISTOL.

IN appointing their jurors to award the medals of the International Exhibition, the Bristol Photographic Association acted wisely in nominating, among others, a portraitist in the town of established reputation. Mr. Midwinter's portraits would, indeed, entitle him to take high rank in the metropolis; but, perfect as they are, both from an art and technical point of view, it is not on this account alone that we ask our readers to visit Mr. Midwinter's studio. It is more because the little establishment of Mr. Midwinter's—for it is not a large one—is one of the most finished and perfect ateliers we have ever seen, and is, indeed, in many respects, a model studio.

If you want a thing well done, do it yourself, is the axiom adopted by Mr. Midwinter. The studio and dark rooms have but one ruler. "Before the advent of gelatine plates, I required the services of two assistants; now I have only one. Nobody seems to have insisted upon the saving, gelatine has worked in this direction," said our host; "gelatine plates save me the salary of a junior assistant, and this is a matter of some consideration in a small establishment." Mr. Midwinter is so fervent a believer in gelatine, in fact, that he has not a silver bath in the house, and for the past eighteen months has employed none but the gelatino-bromide process.

But we must first say a word or two about Mr. Midwinter's portraits. Had we to describe their prevailing feature, we should say it was to be found in simplicity of pose. The backgrounds and accessories, when apparent, are the very reverse of elaborate, and the pose and attitudes chosen appear to be altogether unstudied and natural. We say, appear to be, because, as everybody knows, the less one sees of an artist's handiwork in his result, the more modest, unaffected, and pleasing is that result likely to be. How few photographers, for instance, could pose a model like this female figure on the easel! She stands before you a supple form, full of grace, her arms in front of her, one hand simply laid upon the other. Or, turn to this group—Mr. Midwinter tells us it was taken not long ago, at four in the afternoon—and look at that little maiden laughing at you—a fresh, girlish laugh, like a burst of sunshine. There is nothing mechanical, tricky, or stagey about the picture: it is nature itself.

---

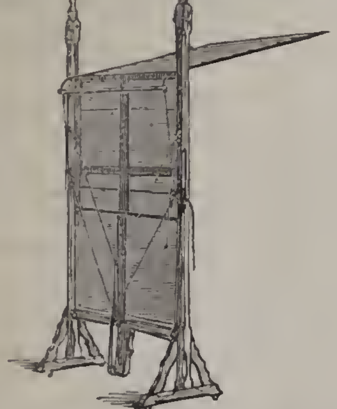
* See our issue of December 17th, 1880.

Our readers will like to know what the Bristol public pay for good portraits. According to the card of terms, cartes-de-visite are charged from ten to twelve shillings a dozen, large heads being at the rate of fifteen shillings; while cabinet portraits, if plain, are twenty shillings, and vignetted, thirty shillings a dozen. Underneath, we are glad to read the words: "The above terms are strictly for payment at the time of sitting." The reverse of the card of terms is an appointment form, in which the date and hour require to be filled in to complete it.

We pass into the studio. It is the lightest and brightest we have ever seen. The whole of one side, barring a three-foot skirting-board, is of glass, and the sloping roof is, to a great extent, glass also. The fact, too, that the ribs and framework of the structure are of iron, adds further to its light and airy nature. A pale blue paper covers the walls, and as there is nothing but a camera at one end of the studio, and two or three screens at the other, a sense of space and freedom prevails, rarely to be met with, even in very big studios. All is as clean and bright as a new pin, qualities that photographers might certainly study more than they do.

Our visit is on a dull December day, and at the moment Mr. Midwinter is availing himself of all the light he can—a lucky man, indeed, to have so much at his disposal.

But how does he manage to subdue the illumination in fine weather, it will be asked? In the first place, he acts after the manner of many Parisian photographers; he can stop out the top light by a system of blue blinds or white blinds, or even both together. Roller blinds are used that lap one over the other, the blinds at the top pulling down, and those below pulling up. The roof is neither clear nor ground, but frosted glass, and with very good effect. This frosting Mr. Midwinter brings about by the application of a mixture of driers and oak varnish, to which a little French blue is added to take away the yellowness. But the model is lighted—or, rather shadowed, if we may so term it—by local screens, rather than by the window blinds. On the light side of the sitter is a fine cambric screen similar to that employed by Mr. Slingsby, of Lincoln,* while on the shadow side is a screen of calico with a canopy at the top, bending over at right angles above the sitter, this canopy being heightened or lowered at will to suit the height of the sitter. The canopy is of a blue or slate colour, and so that our readers may more fully understand its nature, we give a sketch of the whole structure. By the aid of these screens the local lighting of the model is easily controlled.



The structure consists of two side screens, one above the other, and an over-hanging or head screen. Of the two side screens, the lower one remains stationary, but the other one, which overlaps, may be made to rise to its full extent; in our sketch it is half-way up. The structure may, in fact, be raised to 8 feet, or lowered to 4 feet. The head screen rises and falls with the side screen, and, provided with the lever arrangement shown in the sketch, may be made to assume any angle. The lower cord raises or lowers the side screen, and the upper cord regulates the angle of the head screen or canopy.

Mr. Midwinter's experience of his studio, and the light therein, permits him to develop with singular constancy. His rule is to develop invariably for sixty seconds, and he holds a negative to be unduly exposed that does not give a good result with this constant treatment. He has learnt to know his developer so well that he prefers to take this as his starting point, and to make other conditions bend to it. He employs a pyrogallic developer, but uses only half the quantity of pyrogallic set down by standard makers in their formulæ. When results are not as they should be, he does not vary his development, but prefers to alter the lighting or time of exposure. Mr. Midwinter lays great importance on the circumstance of having one condition in the preparation of a negative always constant.

The employment of gelatine plates is not the only economy Mr. Midwinter practises. He employs nothing but albumenized paper ready sensitized for printing, and avows that the tones and quality of his pictures are fully equal to paper sensitized at home; so that he neither requires a sensitizing bath for plates or paper. The printing rooms and washing rooms, all in apple-pie order, are distinguished for the same brightness and cleanliness we have before remarked upon, qualities, we believe, inseparably connected in the minds of tidy housewives with the fact that you can—if you like—eat your dinner off the floor.

Mr. Midwinter shows us his washing trays and dishes. They are self-made; a frame-work of wood, with a sheet of plate glass let in, not at the bottom of the frame, but only half way down, so that each utensil is a double dish. You might employ one side for a hyposulphite solution, and having done with the liquid, and thrown it out, turn over the bath, and employ the other side for developing dry plates in pyrogallic solution. There is thus no fear of contamination. A glass plate bottom being perfectly flat permits of employing much less liquid than is necessary in the ordinary bath. A shellac varnish applied to the woodwork protects it from the action of any liquid with which it may come into contact.

Promenade portraits are already a favourite style in Bristol; but we are glad to see that carbons on opal are also becoming popular with the public. A cabinet portrait on opal, the shadows gummed a little to throw them up, and, perhaps, the features lightly touched, makes a delightful picture that can scarcely fail to attract; a well-executed portrait of this kind, perfectly permanent, and with all the softness of an exquisite painting, should command a ready sale at a guinea; and we are pleased to learn from Mr. Midwinter, speaking on behalf of Bristol, there is likely to be some demand for such pictures.

The "At Home" next week will be "At Pentonville Penitentiary."

ON THE SENSITIVE SALTS IN EMULSIONS.

BY J. BARKER.

When one reads that a certain thing cannot be done that the reader has been in the habit of doing for years, the said reader may perhaps be pardoned for feeling somewhat incredulous.

Dr. Eder says, on page 621, Vol. XXIV., that bromo-chloride of silver cannot be developed without fog unless sufficient bromide of potassium be added to the developer to transform all the chloride of silver to bromide, and even then great care has to be taken to avoid fog. This, however, is an acknowledgment that bromo-chloride of silver *can* be used, and is one point gained from his previous remarks; but suppose it was absolutely necessary to use bromide in the developer—what of that? It is equally necessary to use it with a plain bromide emulsion if clean shadows are required? But I can assure Dr. Eder that a negative from bromo-chloride of silver always looks nicer (as even if fogged it has a better appearance than a fogged bromide plate), and when at its best has a bloom never seen on bromide plates, and, furthermore, that one of the best ways of adding to this bloom is to substitute (say) chloride of cadmium for bromide in the developer.

---

* See Mr. Slingsby "At Home," in last volume of the News.

Dr. Eder says that chloride of silver "is very little sensitive, and is less sensitive than the most bromide emulsion"; but in another place he says that it is "tolerably sensitive to light, and receives equally the latent image during the exposure necessary to bromide of silver." How are we to reconcile these two statements?

My own opinion is that, for all rays—from blue to violet—chloride is the most sensitive, and from blue to red the bromide takes first rank. I therefore submit that a bromo-chloride emulsion is more sensitive than one made with either salt alone; whilst with regard to iodide, it is as yet an open question, in consequence of the best method of developing it not having yet been discovered. For, although a strong solution—made from some samples especially—of iodide of ammonium is very insensitive, yet a dilute solution of iodide of silver made from iodide of iron is very sensitive. I can, therefore, see nothing very absurd in the use of iodo-bromide emulsion, provided the iodide is in minute quantities.

There is evidently some peculiarity in Dr. Eder's method of procedure, or he would not find it desirable to use such a large percentage of bromide as given in his own formula, and which he says is necessary to prevent fog. Now the formula I gave contains a rather small excess of haloid, and this, perhaps, explains why Dr. Eder obtains a slight fog with it—our two methods of working differing essentially, as my opinion is, that the less excess of haloid, the better the result; and, in certain instances, I prefer an excess of silver.

I, however, question very much whether a gelatine emulson is ever made, unless extreme care be taken, without containing at least a small percentage of chloride of silver. The water generally used contains a small amount of chloride. The bromide or iodide itself often contains chloride. The gelatine—French especially—contains chlorine in some form. And lastly, the water used in washing usually contains chlorides in some proportion; and other instances might be given, from all of which sources chloride of silver can be, and is usually, produced.

There are at least three conditions to be studied in this matter; namely, the physical, the chemical, and the electrical. The last requires a separate article, as much has yet to be written upon this condition of the haloids. The first has been well treated by Captain Abney; and with reference to the last I beg to submit the following propositions:—

1. Chloride of silver prepared by the action of chlorine upon silver foil, and kept perfectly dry, is not darkened by the action of light. For visible action to take place, water must be present.

2. Chloride of silver prepared from certain chlorine salts and nitrate of silver is more sensitive, and takes a darker tint than when prepared from chlorine and silver.

3. Chloride of silver behaves differently when prepared from different bases. For instance, that made from chloride of ammonium is more prone to fog than if prepared from zinc, cobalt, or cadmium chloride.

4. If organic matter be added to the above, a still darker tint is obtained, and that with greater rapidity.

5. The best form of organic matter seems to be the nitrogen compounds, doubtless owing to (*a*) the tendency which these compounds have to decompose spontaneously; (*b*) that alkalies, acids, and increase of temperature all cause the evolution of the nitrogen in the form of ammonia; (*c*) that these compounds contain two elements that have great affinities for the elements of water.

In conclusion, I take the liberty of suggesting to those who aim at perfection in negatives, that they endeavour, as a means of obtaining the same, to combine albumen and collodion with bromide of uranium and chloride of silver.

GELATINE PLATES AND RESTRAINERS.

BY H. A. H DANIEL.*

My thoughts of late have been much drawn to the fact which continues to force itself with very few exceptions upon all photographers, viz, that, notwithstanding the many great excellences of gelatine, it does not yet appear to have equalled wet collodion as an "all-round" process. If we take gelatine plates as applied to instantaneous work, then, I presume, no one will for one moment say that collodion is to be compared with it. For proof of this one only requires to look at some of the really wonderful instantaneous pictures in the International Exhibition now open, and which no one would ever have dreamt of attempting with collodion. But, if we confine ourselves to general landscape work, I think those who are prepared to assert that the gelatine process adequately takes the place of the wet collodion process might be numbered almost, if not quite, on one hand.

On carefully considering the subject and asking ourselves the question—Where does the gelatine process fall short?—I think the reply is somewhat to the effect that there is a want of latitude—or, perhaps, more properly, adaptability—about it, and, as a consequence, a want of positive certainty, which those who have done much work with wet collodion cannot help feeling to be its chief fault. Photographing either dark interiors, shady glens with brooks running through them, or broad, well-lit, open landscapes, a competent artist feels certain with wet collodion to get equally good results if he adapt his *modus operandi* to the subject. But I venture to assert (without for one moment desiring to be at all egotistical) that the gelatine worker at present has not the means for adaptation and securing equally good results in widely different subjects. It seems to me that in landscape work there is about gelatine (notwithstanding its great recent improvements) a lingering want of harmony.

In such a subject as I have before spoken of, one would carefully expose for the darker parts and full details of the nearer portions, feeling certain that far-off hills, with mist and atmospheric effect, and light-coloured foliage at a distance, would take care of themselves and develop with thoroughly true effect; whereas, with gelatine plates, we all know there is a great tendency for the distant parts first spoken of to become almost obliterated, and often quite absorbed in the sky, and unprintable. What is the cause of this? From some little experience with about four dozen ten by eight gelatine plates in North Wales this past summer (when I selected widely-diverse subjects), I am inclined to think that, as a rule, gelatine plates are more sensitive in proportion to the lighter and more distant parts of a picture, than to the darker portions and foreground. I know many confidently assert the contrary, but I think the majority of photographers will bear me out if they carefully consider it when looking at their own and others' gelatine work, although here and there one finds a perfect gelatine picture. Still, amongst those who stand highest on the list of gelatine workers, many considerably inferior to their general collodion pictures are seen. If distant mountains with their peaks in the clouds, or snow-capped, be really finely rendered, the shadows and foreground are probably heavy, or *vice versa*.

I am inclined to think that, besides the modification of formulæ to suit different classes of subjects, suitable restrainers during development are of the utmost importance. I have been experimenting a little lately in this direction, and, being partial to Dr. Eder's ferrous oxalate developer (especially when carefully restrained), have tried the addition of Mr. M. Carey Lea's collocine to it in the proportion of one drop to about three ounces of developer, and I think I may say with some success. Through want of time I have been unable to make as many experiments as I could have wished. I have, however, laid on the table two negatives taken under exactly similar circumstances. They were reproduced through the lantern from a slide (also being rather enlarged, I should say about twice as large). The lamp was a Newton's triple wick, the plates of Bennett's make, the aperture of lens five-eighths of an inch, and the exposure, in each case, exactly three seconds. They were taken one after the other without any delay between, so that all circumstances were exactly identical. The one marked C had one drop of collocine to about three ounces of developer; the other the same developer *minus* the collocine. I think it will be apparent that the negative marked C, although equally as full of detail everywhere, is a far more harmonious picture than the other. It is quite brilliant, but the high lights are not so dense and inclined to be hard as those in the negative developed with plain ferrous oxalate. There is no loss of detail, no loss of brilliancy, but a delicate softness and harmony, without the slightest tendency to want of vigour.

---

* Read before the Bristol and West of England Amateur Photographic Association.

The use of collocine may be known by others; but, not having used it myself before, I thought it might interest those present if I introduced the subject this evening, as I think it is only by everyone doing what they can, and communicating what they know, that the few finishing touches required by the gelatine process will be given.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Iodide and Ammonia in Gelatine Emulsions—Electric Light for Photography—New Styles in Portraiture—The Hydrokinon Developer.

Iodide and Ammonia in Gelatine Emulsions.—The latest publications of Dr. Eder in our issue of December 24th, and Captain Abney in the Photographic Journal of the same date, have cleared up this matter in such a satisfactory manner that the whole fraternity is indebted to both investigators for the thorough and impartial manner in which they have investigated the question. In general, it may be said, both are right, although, perhaps, each of them arrives at conclusions a little too favourable to the opinion in question. We give a modified account of Captain Abney's results in a tabular form, as this may, perhaps, facilitate comparison:

No. of gelatine emulsion.	Silver salts.	Manner of emulsification.	Final treatment.	Sensitiveness. 1st day.	Sensitiveness. 2nd day.
1	Br	With ammonia nitrate of silver	None	3½	4½
2	BrI	,,	,,	3	4
3	Br	Cooked with the whole set of gelatine	With ammonia one hour	5	6
4	BrI	,,	,,	5	6
5	Br	Cooked with a part of the gelatine employed	None	5	9
6	BrI	,,	,,	5	10
7	Br	,,	With ammonia one hour	8	9
8	BrI	,,	,,	7	10

We regard experiments Nos. 1, 2, 7, and 8 as favourable to Eder's opinion; as this investigator says, in our issue of December 24th, p. 620:—"An emulsion of gelatino-bromide of silver containing one-twelfth of iodide is distinctly less sensitive *when the emulsion has not ripened.*" Not quite in accordance with Eder are the results of the experiments 3, 4, 5, 6, as Eder also says:—"An iodo-bromide emulsion prepared with ammonia is, under the same conditions, less sensitive, even when it has been longer digested." But, in general, the favourable action of the final treatment with ammonia is proved by the experiments 7 and 8; and I think this statement possesses a great value. It may be true that we can get the same sensitiveness without ammonia by waiting a day longer; but very often *a short* method of preparing an emulsion of high sensitiveness is of great value. On the other hand, it must be remembered that a greater tendency towards fogging may arise from the treatment with ammonia rather than from another proceeding. Generally, emulsions are formed with an *acid* reaction, and, under these circumstances, reducing organic matters have but little influence; but if the reaction is made to become alkaline by the addition of ammonia, the reducing qualities of the matters in question are much increased, and may give a tendency to fog. We are very much indebted to Mr. Wilson for the special description of his process of making emulsions. It is certainly a very simple one; but we can only get an exalted degree of sensitiveness if we add the silver salts at a temperature of about 150° F. The action of cooking is a remarkable one, but we wish to call the attention of our readers to the difference of the temperature in the hot water bath and in the emulsion bottle or jar which may be placed therein. If we use a porcelain jar, the temperature only reaches 194° F., although the water may boil in the outer vessel. In general, the cooking process is now preferred to the old process of digesting; but practical emulsion makers know very well that some samples of gelatine are not suitable for the cooking process, though they may be used without trouble for the old method of emulsifying.

Electric Light for Photography.—Electric light for photographic studios has been a success in England, but a greater one, we believe in Russia, especially in St. Petersburg, where the days in the winter season are so short, that daylight suitable for photographic work lasts only two hours. It was Mr. Levitzky, photographer to the Court, who first introduced electric light there. We are told that he employs a dynamo-electrical machine of the Siemens' form, but of greater power than those of Mr. Vander Weyde, so that he makes pictures in three seconds. Indeed, we have some first-rate pictures from him now before us, and they possess a wonderful softness. A picture of the Prince Constantine with his children is marked "exposed five seconds." More singular than this, is an out-door picture, taken at midnight; it represents the Café Livadia, in St. Petersburg—exposure fifteen seconds. The building is only illuminated by electric lamps; but although the result is not comparable to a picture taken in daylight, it is interesting as showing what can be done in the way of outdoor work by electric light. In taking interiors, Mr. W. Siemens, in Berlin, has employed the electric light successfully, and he gives a short report of his *modus operandi*, which we will epitomise here. Mr. Siemens employed two electric lamps; one was put on the camera, and gave a front light illuminating every point visible from the object glass; the other was a side light, out of the angle of vision of the camera, and it served to produce those shadows which are necessary for every picture. The subject was a large reception room in Mr. Siemens' residence, and the picture obtained was a first-rate one.

New Styles in Portraiture.—Besides the promenade, or panel picture, and others, there are now some about double the size of panels; and it seems that this new style, the right name of which we don't know, is already much employed by the chief photographers of New York. The new size necessitates fresh albums and new frames, and so photography invites fresh industrial activity. Photography has its fashions, some changing every year; and people like to see something new, no matter whether it is more beautiful than the older fashion or not. A new size may be easily adopted; but not so easy is the art of arranging a figure suitably for the size in question. This is especially true in regard to the long shape of the promenade and panel; these forms having arisen in consequence of modern female costumes, just as the cabinet size arose in consequence of the crinoline. We prefer the new fashion of costume to the older one; but we must confess that there are many photographers who don't know how to arrange the modern lady's train in a picturesque manner; as many young and elegantly-dressed ladies are arranged so as to resemble corkscrews.

The Hydrochinon Developer.—Captain Abney proposed the new developer. He expressed the opinion that it would be possible for the chemist to make hydrochinon in a cheap manner by artificial means. Indeed, hydrochinon is a precious body, so that the expenses of developing a 5 by 8 plate with it amounts to about one shilling; but we don't know of any successful process for manufacturing it more cheaply. Modern chemistry has given a method for the preparation of bodies of much more complicated composition—as, for example, alizarine—and the importance of this discovery is, indeed, very great, as it has made the culture of madder in France a mere shadow of its former self, the yearly loss France suffers in this way being about 35,000,000 of francs. Now, Professor Baeyer, of Munich, has discovered a method for the artificial preparation of indigo, and already artificial indigo is in the market. It is quite possible the indigo culture in India may be seriously influenced by this discovery.

Notes.

The Photographic Society have awarded to Mr. W. Willis the progress medal, for his platinotype process.

The Bristol Photographic Exhibition—certainly one of the finest and most complete ever held in this or any other country—closes to-morrow evening, when the distribution of medals will take place.

It is always a treat to witness a lantern exhibition when good transparencies are at hand, and at the last meeting of the South London Society several charming pictures—notably those of Mr. Williams and Mr. England—were shown. But in the case of all the views from nature, there was, nevertheless, a tendency towards glaring high lights and inky shadows—difficulties, we fear, almost inseparable from transparencies prepared with silver salts.

The particles of silver deposited in the shadows are so opaque that light passes them with difficulty, and for this reason high-lights appear all the more glaring. Carbon tissue, especially if prepared with Indian ink of the best quality, will give transparencies free from the above defects, and since pictures upon glass are so readily prepared by its means, it is really matter for surprise the material is not more generally used. A voice suggested platinotype, the other night, for transparencies, but we fear the platinum black deposited would be open to the same objection as silver.

Mr. Willis, of Scarborough, has been experimenting with the Vogel emulsion, and sends us two capital pictures he has taken with it. He reports that the films take about an hour to dry, their sensitiveness being but little behind the best gelatine plates in the market.

Holmes ozone bleach appears to be an aqueous solution of some hypochlorite, and, like many other commercial preparations, is being applied to photographic uses. When mixed with from three to eight parts of water it serves very well to reduce the vigour of over-dense gelatine negatives; and it may be applied with a tuft of cotton-wool to parts of the picture, or employed as a bath. It seems not only to reduce the image, but also to dissolve away the surface of the gelatinous film. We have also tried a somewhat weaker solution for reducing an over-exposed carbon print; in this case the reduction was twofold, as a solvent action was exercised on the gelatine, and the fugitive portion of the pigment was destroyed or bleached. This appears to be an important application of the solution, as about one-half the pigment in an ordinary carbon print can be thus removed, and this affords a considerable reduction in case of over-exposure.

Still another use for the "ozone bleach." One often wants to whiten an engraving, or other printed matter, previously to photographing for photo-lithography or other similar purpose. Half an ounce of the solution in a pint of water is just the thing.

A vulgar glaze upon a photograph is scarcely to be commended; but some recent cabinet portraits we have seen, emanating from the famous studio of Levitsky, in St. Petersburgh, show very plainly that a glaze is not necessarily vulgar, but, on the contrary, may, in an artist's hands, be made to render shadows transparent, and to confer upon a picture the softness of ivory.

The pictures of M. Levitsky to which we refer are taken by the electric light—the St. Petersburgh Court photographer prefers it to daylight—and are toned to a chocolate tint. As regards lighting, they are soft, rather than brilliant, the glassy surface possibly correcting any flatness that might otherwise be apparent. There are no margins, but the whole face of the card is covered with an exquisite glaze, the centre being embossed.

Sketches of London life, more vivid than those of George Cruikshank, are likely to result, if Mr. Bolas' "detective camera" is made much use of. The camera, whether disguised as shoe-black's box, or other portable implement, may well defy detection, and everyday scenes in the midst of London life are thus to be seized and recorded without difficulty.

Mr. Bolas exhibited his camera to the Photographic Society on Tuesday last, and showed some of its results. The life and character of these London sketches were graphic in the highest degree. A group on the stairs of Blackfriars Bridge—a pedler seated beside his wares, with a companion on the stone steps, engaged in a brown study—was a wonderful picture. A visit to Covent Garden and Billingsgate in early morning would be prolific of such sketches, only the photographer, to be successful, must take care to disguise himself as well as his apparatus.

The "unit of light," so far as the committee who are undertaking to settle the question appear to have gone, is likely to be represented by a tablet of phosphorescent paint some three inches square. The surface of this tablet is to be made luminous by burning close to it a certain length of magnesium wire, and the light given off immediately afterwards is to represent a "unit of light." The proposal, as we say, is only a tentative one so far, for there are obviously many difficulties to overcome before a "unit" of this kind could be generally recognized.

Messrs. W. and D. Downey will be gratified to learn that their laughing portrait of Samary, in which the lively young actress of the Comédie Française exhibits a whole row of pretty teeth, has been adopted in the dentist's show-case to prove the axiom that with good teeth a woman is never otherwise than beautiful.

Poor Mr. Kirby! He photographed Roundhay Church, near Leeds, and as the customers would not come to him for copies, he went to them. The local wiseacres then summoned him for peddling without a licence, notwithstanding the fact that the articles were Mr. Kirby's own handiwork. Being in doubt as to the validity of Mr. Kirby's defence, they postponed the summons for a week, in order that the clerk might instruct himself in this very simple case of law.

FRENCH CORRESPONDENCE.

Objections to the Use of Calcium Sulphide in Gelatino-Bromide—Working the New Woodbury Process—Mistaken Use of the Designations Actinometer and Photometer—A New Result Realised by the Selenium Photometer—Good Wishes for the New Year.

Calcium Sulphide in Gelatino-Bromide.—The proposal of Mr. Henderson to increase the sensitiveness of bromised gelatine by adding to the emulsion a quantity of finely-powdered calcium sulphide appears to me not likely to produce a satisfactory result, chiefly on account of the density of the salt being so great as to prevent its mixing intimately with the emulsion. I have myself tried to introduce the sulphide into a gelatine of almost a pasty consistency, and the precipitation of the powder was effected most rapidly. On the other hand, supposing that an homogeneous mixture could be produced, there would be formed on the surface of the plate a reticulated grain of great opacity, which would be very detrimental to the delicacy and purity of the image. Lastly, the contact of the sulphide with a salt of silver would give rise to the immediate sulphuration of the silver, even in a dry state. This result may be observed by dropping a little powdered calcium sulphide on different parts of a gelatino-bromide plate; a sulphuration of the parts in contact with the powdered sulphide will very soon take place. The idea, however, which lies at the foundation of Mr. Henderson's proposal has a great deal to be said for it, since the object is to bring into the presence of a sensitive body a substance endowed in a high degree with the power of absorbing light. The question, therefore, arises whether we cannot attain a similar result by using a substance of less density, of greater transparency, and the contact of which with sensitive bodies is less liable to produce a partial decomposition. There are other substances which are capable of absorbing light, which are soluble in water or alcohol, and whose action on the salts of silver is not so deleterious. It is my opinion that by studying these substances we shall be better able to realise the proposed object that Mr. Henderson has in view.

Working the New Woodbury Process.—The patent rights in France of Mr. Woodbury's new photoglyptic process have been sold, as I have already stated in previous correspondence, to the firm of Hutinet and Co. This firm, under the able management of M. Lamy, is now busy in making all the necessary arrangements for working the new process on a large scale, and as the process does away with the use of the hydraulic press, it is to be hoped that it will be within the reach of everyone. Already the greater part of the plant is ready, though a few essentials to complete the preparations for working the process are not yet in order. Thanks to their thoroughly understanding what is required to make this new method of printing a success, we shall be able to rely upon Messrs. Hutinet for the supply of everything that is necessary for carrying on the process with the greatest simplicity and facility. Then we shall find there prepared paper of any required thickness for taking the relief in gelatine; also the printing paper double size, and perfectly glazed between two plates of steel (in itself a great advantage); in a word, all the implements and materials necessary for working this charming process. I feel perfectly convinced that this method of introducing the new process to public notice must contribute greatly to its success, but I hope that the prices for licences under the patent may be such as to allow of persons with moderate means availing themselves of its advantages.

Mistaken Use of the Terms Actinometer and Photometer.—Up to the present we have, most of us, been in the habit of designating indifferently, under the names of actinometer or photometer, all the instruments intended to measure the action during a fixed time of light upon various sensitive substances by means of chemical decomposition or colouration, &c. These words are really improperly used for the purpose indicated. For my own part, I never saw any great harm in the mistake, and I should not have thought it necessary to confess my transgression, committed in so numerous and good a company, if I were not now confronted by a new instrument, which alone seems to me to deserve the name of *photometer*. But if that be the case, certainly all the other instruments hitherto in use under the designation of photometers must suffer a change of name. M. Eug. Marchand was before me in pointing out that the title *actinometer* given to an instrument to measure the chemical effects of light was not a correct one. Derived from the word ἀκτῖνος, it expresses only the energy of the sun as an illuminating body; it is the same with the word photometer, which refers to the illuminating power of any other bright body. M. Marchand purposes to do away with these words, and to replace them by the term *Antitupie*, derived from the Greek word ἀντιτυπία, which signifies reaction. He constructs from this the two words *Photantitupie* and *Photantitupimeter*, the latter serving to designate the measurement of the energy of light. I confess I have some hesitation in following M. Marchand on this point; however good his etymology may be, I do not like to adopt a word which is not very euphonious, which is difficult to pronounce, and which many people will find great difficulty in remembering. There can be no doubt, I think, that the word would gain by being mutilated; but this is a doubtful advantage. I believe the best way out of the difficulty would be to add some qualifying title to the expressions actinometer and photometer where they are used to designate instruments intended to measure the chemical action of light. Thus, we might call the instruments of Roscoe, Marchand, &c., photo-chemical actinometers.

New Result Realized by the Selenium Photometer.—I have stated above that I am now confronted by a real actinometer or photometer in the proper sense of these terms. This is the instrument for measuring light by means of the electric conductivity of selenium, an account of which I gave the readers of the Photographic News in my last letter. The instrument does, in fact, for light what the thermometer does for heat, and if I may be allowed the expression, it is a light thermometer—or, more correctly, a real photometer. It indicates in degrees the variations of light, the same as the thermometer shows the variations of heat; it marks at the time when it is consulted the exact amount of illumination just as the thermometer marks the state of the temperature. There is in this apparatus no chemical combination or decomposition, but a purely physical action, just as in the dilatation or contraction of the mercurial column in the thermometer. Light modifies the condition of selenium only physically; the metalloid re-assumes its normal state so soon as the course of the change has ceased. Now, an instrument of this kind has not hitherto come within the range of our investigations; we have up to now made use of the chemical action of light on chemical substances, from which we have been able to deduce the total amount of the illuminating energy in a given time, but without having the means of knowing at any particular moment by simple inspection what is the actual degree of light thrown upon the instrument. The ingenious photometric apparatus of M. Warnerke, which is based on the phenomenon of phosphorescence, only indicates a degree of light after exposure; this exposure may be a very short one, but it is long enough for variations in the degree of light to have taken place during its duration. These variations may even extend from the maximum of full sunlight to the minimum of diffused light caused by the sudden interposition of a cloud or mist. Certainly the instrument of M. Warnerke is very good for photographic purposes, although its principle does not depend on photo-chemical decomposition; but it certainly does not comes up to my ideas, which I have already mentioned, of a light thermometer.

Good Wishes for the New Year.—This being the last letter which I date in the year 1880, let me seize the opportunity of addressing to all my readers in the Photographic News my best wishes for the year 1881. During the last year I have committed many faults in my correspondence, and have, therefore, need of much pardon, especially as I cannot hope to do any better in the year to come; but I promise to omit nothing in my power to give as correct and full information as possible of all the events in the photographic circles of my own country. Leon Vidal.

Topics of the Day.

ON THE PROLONGED ACTION OF ALUM FOR REDUCING DENSITY.

BY VALENTINE BLANCHARD.

At a recent meeting of the Photographic Society I made a brief statement on this subject. Since then I have made further experiments, and am so well pleased with the results, that I feel justified in recording them, being satisfied that many of the readers of the Photographic News will derive great benefit therefrom.

The use of alum is, of course, well known to all dry-plate workers, and I, in common with many others, have often employed it both after as well as before fixing. But the great advantage to be derived from the prolonged action of alum was the result of an accident. Late one day, when the light was all but gone, the last of some negatives of a lady was thrown aside as being too dense; I did not need it, and therefore put it into the alum bath to remove the yellow colour caused by forcing the development. I forgot all about it, and it was left until the next morning. When I took it out of the bath, not only was the yellow colour entirely gone, but the density so much reduced that this discarded negative is now undoubtedly the best negative of them all. This negative was shown to Mr. Sebastian Davis, Mr. Mawdsley, and Col. Stuart Wortley, who all expressed surprise at the results. I showed them a negative, just done by a pupil, which was also dense and yellow. This I placed in the alum bath, and left from Saturday till Monday. The reduction in intensity was very considerable, and a worthless negative from over-density was converted into a quick printing negative.

Since then I always place the negatives, after fixing, in the alum bath, and with the most marked improvement in their printing qualities. They now print in about the time of wet-plate negatives. Should, by any chance, the negative be a little denser than I desire, I then leave the plate all night in the alum bath; but in the ordinary way a few minutes' immersion is all that is needed. Captain Abney states that it is only the yellow stain that is removed by the alum. I can only say that detail evidently buried in the film is brought out by continued treatment in the alum bath. So many advantages are gained by the use of alum in the manner I propose, and with no drawbacks at present apparent to me, that I should strongly counsel all dry-plate workers to adopt its use. I do not think it need at all materially lengthen the operations in the dark room, for undoubtedly a much shorter time may be given to the washing operation after the fixing bath. The alum would decompose any hyposulphite left in the film, and the film itself is so much hardened by the action of the alum that not a great deal of washing is needed after it.

A large stone jug should be kept ready in the dark room. Have plenty of alum in it, and stir up from time to time, when fresh water is added, so as to be sure of having a saturated solution. Should the alum solution be made with hot water, it will be necessary to wait until the solution is quite cool, or the alum will crystallize on the plate. Should, however, this happen, prolonged washing will dissolve out the crystals; but it is better to guard against this evil. Three great advantages are gained by the use of alum as above described:—The yellowness can be so completely removed that the negative may be mistaken for a wet plate; details apparently buried in the film by over-density can be brought out; and, finally, the film is made so hard that it is much less likely to be spoiled by damp. I am sure all those who try alum as proposed above will continue its use.

The "Topic" next week will be on "Developers and Developing," by Alexander Cowan.

IODIDE AND AMMONIA IN GELATINE EMULSIONS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.*

I would now pass on to describing my results when employing Dr. Eder's methods of emulsification, and the use of ammonia, as given in the last number of the Photographic Journal.

A variety of emulsions were made, and tested one against the other in many ways.

I give, in a tabular form, the results:—

No. 1.—	Potassium bromide	93	grains
	Swinburne's No. 2 isinglass	30	,,
	Nelsou's No. 1 photographic gelatine	120	,,
	Water	2½	ounces
	Silver nitrate	115	grains
	Water	2½	ounces.
No. 2.—	Potossium bromide	93	grains
	Potassium iodide	10	,,
	Nelson's No. 1 photographic gelatine	120	,,
	Swinburne's No. 2 isinglass	30	,,
	Water	2½	ounces
	Silver nitrate	127	grains
	Water	2½	ounces.

In these cases the silver was precipitated with liquor ammonia, enough being added to redissolve the oxide. This solution was added, drop by drop, with violent shaking, to the solution of gelatine and bromide, the temperature of the emulsion being kept at 110° for a quarter of an hour after mixing.

In all cases where iodide was used it was dissolved in two drachms of water, and added to the emulsion when about half the silver solution had been used up.

The emulsions were then poured out into a dish, allowed to set, and thoroughly washed for the same length of time in both cases.

No. 3 and No. 4 were made with the same proportions of bromides, &c., as Nos. 1 and 2 respectively. No ammonia was used till the emulsions had been boiled half an hour, when they were allowed to cool to 70° F., and two drachms of ammonia, ·880, added, and kept at that temperature for an hour. They were allowed to set, and washed in the usual manner.

No. 5.—	Potassium bromide	93	grains
	Nelson's No. 1 photographic gelatine	15	,,
	Water	1½	ounces
	Silver nitrate	115	grains
	Water	1½	ounces.
No. 6.—	Potassium bromide	93	grains
	Potassium iodide	10	,,
	Nelson's No. 1 photographic gelatine	15	,
	Water	1½	ounces
	Silver nitrate	127	grains
	Water	1½	ounces.

Nos. 5 and 6 were emulsified in the usual way, and then boiled for half an hour, and 105 grains of No. 1 photographic gelatine and 30 grains of Swinburne's isinglass were dissolved in two ounces of water, and added to them. They were each divided into two parts, and one half of each was digested with one drachm of strong ammonia, as in experiments 3 and 4. The other halves were washed without having been digested with ammonia. All were allowed to set, and then washed as usual. Those portions of the emulsions treated with ammonia we will call Nos. 7 and 8 respectively.

---

* Continued from page 9.

Plates were coated with all the emulsions: 1st, on the same day on which the washing was complete; 2nd, on the day after; and then tested one against another. It may be convenient to call the greatest sensitiveness 10, and to show the others by lower numbers. We find the following results:—

No. 6	2nd day	10
No. 8	2nd day	10
No. 5	2nd day	9
No. 7	2nd day	9
No. 7	1st day	8
No. 8	1st day	7
No. 4	2nd day	6
No. 3	2nd day	6
No. 4	1st day	5
No. 3	1st day	5
No. 6	1st day	5
No. 5	1st day	5
No. 1	2nd day	4½
No. 2	2nd day	4
No. 1	1st day	3½
No. 2	1st day	3

It may be useful to remember that the odd numbers contain bromide alone, and the even ones iodide with the bromide.

It will be seen when boiling with a small quantity of gelatine (Nos. 5, 6, 7, and 8), that on the second day the plates containing iodide (6 and 8), have a little the advantage over those which contain bromide alone, and that the digestion with ammonia (8) gives no increase in sensitiveness. The same is apparent with 7 and 5, the digestion with ammonia does not increase the sensitiveness with pure bromide. The first day's plates (6 and 8) with the iodide are in every way behind the second day's plates with the bromide, but evidently digestion with ammonia answers partly the same end as keeping the emulsion. The same applies also to Nos. 1 and 2. Boiling with a small amount of gelatine, then, in every case is better than boiling with full quantity of gelatine and then digesting with ammonia, but this plan is far better than digesting with ammonia alone. These formulæ are comparative ones, since they all eventually contain the same amount of bromide of silver, and the same amount of gelatine.*

As regards development, the plates containing the iodide were a little slower in coming out, but, on the other hand, they were certainly much brighter and cleaner.

To test the value of the iodide further, the same formula as Nos. 3 and 4 were used, and the emulsions brought to the boiling-point when the ammonia was present. No. 3 fogged, No. 4 remained quite bright. I have thought that the above experiment might not be devoid of interest, showing as it does that the method so common in England at the present time is not behind the ammonia process. The ammonia undoubtedly makes plates much more rapid than when no boiling is attempted; the sensitiveness in that case might perhaps be represented as 1, but it by no means gives the most rapid kind of plate. I think for comparatively slow plates where good density is required, formula No. 2 is excellent in every way; and if any one has a prejudice against iodide, let him use No. 1.

ON THE USE OF TANNIC ACID AS A PREVENTIVE OF FRILLING AND BLISTERS.

BY EDWARD BRIGHTMAN.†

Few photographers who work with gelatine plates are so fortunate as to entirely escape the annoyance of blisters and frilling of the film; plates otherwise faultless being frequently utterly spoiled by the utter and unexpected appearance of these troublesome defects.

The panacea usually recommended by makers of gelatine plates is a solution of alum applied to the plates before fixing. This application, however efficacious in preventing those blisters which make their appearance during and after fixing, cannot help us in avoiding the blisters which make their appearance during development, as any application of alum previous to development gives rise to markings on the films and uneven development.

During the past summer I had occasion to use a batch of plates for some instantaneous sea views, and was much annoyed by one rising into innumerable blisters immediately the developer was applied. Plate after plate was tried with the same result, and it was quite clear I must discard the whole batch of plates, or discover some means of prevention.

Upon thinking the matter over, the well-known action of tannin on gelatine suggested itself as a remedy: a solution of tannin was prepared and applied to the plate previous to development. This proved a decided success; the blisters had disappeared, and the remainder of the batch was developed with scarcely a sign of either blister or frill.

As an illustration of the superiority of tannin in rendering gelatine insoluble, I have here three samples of leather, two of which are dressed by immersion in a strong solution of alum, the third is tanned in a decoction of oak-bark. On boiling the alum-dressed leather with a little water in a beaker, a considerable amount of gelatine will be dissolved, forming a thick jelly in the glass; but by boiling the sample tanned with oak-bark no trace whatever of gelatine is to be found, the gelatine having been rendered entirely insoluble, and, in fact, converted into leather. In like manner the tannic acid acts upon the gelatine plates, rendering the film insoluble, and so prevents the frilling and blisters.

Correspondence.

MOONLIGHT PHOTOGRAPHY.

Dear Sir,—I said a week or two ago that I would like to say a few words on moonlight photography. Seeing a few remarks in Mr. Cussons' Almanack that require some correction, I am compelled, on my own behalf, to notice them. I cannot understand Mr. Cussons' "belief as to the feat never before accomplished in this country." I believe that gentleman has seen my moonlight photograph; moreover, I believe that anyone who has seen both Mr. Cussons' and my results will—— self-praise is no recommendation; your readers must imagine the rest. If Mr. Cussons' negative had half-an-hour's exposure, mine had seven hours', and I am sure it is fifty times more exposed, and shows sharp detail seven or eight miles as the crow flies, demonstrating how clear the London atmosphere is at midnight. My negative was taken on the night of the 25th of February last, from my billiard-room window; lens, Steinheil's Aplanatic Doublet; size of plates, 8½ by 6½; No. 2 stop; ordinary pure bromide (no calcium phosphor). The emulsion was boiled about fifty minutes. I need scarcely add that with a properly prepared argento-bromide phosphor emulsion, the same or better results might be obtained in a fraction of a second. I would like to ask Mr. Cussons what is the aspect of the house, and how he can account for the sharp shadow from the eaves of the roof, if the exposure was thirty minutes? This is better defined in the original print.—Yours respectfully,

A. L. Henderson.

PS.—I may as well mention that the exposure of my negative, &c., took place in the presence of Mr. Barber, photographer, of Sheffield, who awoke me at 4 a.m. to shut the camera up, and, at the same time, informing me that a large fire had broken out during the exposure. To this I replied that I was glad, as it would be an extra proof of the genuineness of the result. A. L. H.

THE MELBOURNE EXHIBITION.

Dear Sir,—The picture spoken of by Mr. Lindt in your last issue was taken by me when manager for Mr. Skeene, during his absence in England, and was one of a large series of sea and sky pictures I got during the progress of the three S.W. monsoons.

During the time the S.W. monsoon is gathering, bursting, and abating (the three degrees extending over, perhaps, four months), the cloud scenes in Ceylon are superb, and it was during this period, between 4.30 and 6.15 p.m., that the best pictures were secured. It was very pleasant work, and the results amply repaid the trouble entailed in having everything in the best condition.

---

* Since this paper was written the above table has been confirmed.

† Read before the Bristol and West of England Photographic Association.

Mr. Lindt asks how it is done. The answer is, a Dallmeyer's 5D lens, with nearly full aperture; Huggon's collodion; a thirty-grain bath, perfectly clean; plates albumenized; developer, thirty grains; restrainer, collocine.

The native vessel in the path of sunshine is not quite sharp, as I have an idea it is better not so, and I exposed so as to get a slight movement, and the result is all the better. It is a purely unsophisticated negative, no dodges or double printing; but that is only because the result was possible at one operation, else there would have been no hesitation in resorting to double printing.

If any of your readers are about to make the voyage from England to India, and take camera and dry plates, I should advise them to keep all for skies in the Mediterranean, the Suez Canal, the Red Sea, and Indian Ocean, when such a collection may be secured as will be a veritable "joy for ever."

When I was returning to England in May last, I saw a sunset in the Bitter Lakes which I can never forget. For over half an hour there was one rapid succession of the most lovely pictures conceivable, ending by the sun disappearing below the horizon as a globe of fire,surrounded by illuminated clouds. If I had had a camera and a dozen dry plates, I could have filled them all with different pictures.—Yours faithfully, W. T. WILKINSON.

STEREOSCOPIC PICTURES.

DEAR SIR,—A dealer in photographic wares told me the other day that the sale of graphoscopes, to which a stereoscope is generally added, has created a much better demand for stereoscopic slides, which have been rather unsaleable the last few years.

If such be the case in Holland, I may suppose that it holds also good for England. Moreover, the gelatine process enables us to produce, with greater facility, instantaneous stereograms, which were formerly the exception. I am very partial to stereoscopy, and made hundreds of stereograms as *souvenirs de voyage*. The 7½ by 4½ or 8 by 5 plate is very convenient, as well for a single picture as for a stereogram. But I am afraid one of the reasons why stereoscopic slides lost their vogue is the defective instrument through which we look at them, the pictures appearing so small instead of life-size. I remember that some twenty-five years ago a Frenchman exhibited here stereograms which really gave the impression of being life-size, which were much admired. Would it be impossible to your eminent London opticians to devise an instrument which, at a moderate price, might produce the same effect? I think we might thereby have a revival of stereoscopy, and a new trade in instruments and slides be promoted, which would be likely to last for a very long time, not to say for ever, as every one would be glad to look at well-known scenes just as they are in nature, and not dwarfed as we see them now.—Very truly yours,
H. L. T. HAAKMAN.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE monthly meeting of this Society was held on Tuesday at 5, Pall Mall East, Mr. J. GLAISHER, F.R.S., in the chair.

Mr. Charles Andra and Mr. Arthur James Langton were elected members.

A paper on the lime-light, by Mr. E. Viles, was read by Capt. Abney.

Mr. VILES contended that if the jet for the lime-light be properly constructed, there is no danger of an explosion. The jets in common use were made on a wrong principle, and the jet he recommended, after long experience, was simply a Y-shaped tube, the main thing to be observed being that the flow of the gas should be entirely unimpeded. There was not the least use in the mixing chamber attached to the apparatus sold in the shops, save to increase the risk of explosions. The practice of plugging the tube also had the same effect, because it increased the pressure of the gas. Mr. Viles observed that he had never had an explosion by the use of mixed gases. At the Polytechnic, where lime-light exhibitions were of daily occurrence, such a thing was never known, and the same might be said of the theatre, where there were sometimes as many as forty lime-lights in use at the same time. Why, then, should there be any danger when exhibiting the lantern at a lecture?

Mr. BOLAS quite concurred with Mr. Viles as to the immunity from danger in the use of mixed gases if care were taken. He thought it quite possible for an explosion to occur if there were a "suck back," from the combustible gas formed by the admixture with oxygen. An explosion might also happen, as he had once before stated, from the dust from the inner surface of a new bag combining with oxygen, and forming a combustible compound.

In reply to a question of Capt. Abney, Mr. Bolas said he could not tell how long hydrogen could be kept in a bag without escaping, as he always used gas-holders.

Mr. BOLAS then exhibited his "Detective" camera, by which a portrait could be secured without the knowledge of the person photographed. The apparatus consisted of a double camera, one being used as a range-finder, the other for taking the picture. The cameras were enclosed in a box covered with American cloth, and could be easily carried about. The box was light-tight, and the dark-shutter could be withdrawn so that the plate could be exposed at any moment. Mr. Bolas had used his camera for securing pictures of street scenes, and had been able to obtain many successful ones without focussing, taking care that the object was not less than twenty-five feet from the camera. His method was simply to place the box on the ground, and expose by means of pneumatic attachment. He was having a camera constructed without the range-finder, and this form he recommended, as he did not think the range-finder necessary.

A number of street scenes taken with the camera were then exhibited.

Mr. BADEN PRITCHARD said he had that morning received a letter from Mr. Howard Vincent, the Director of the Criminal Investigation Department, on the subject of the camera, and this he had placed in Mr. Bolas' hands.

Mr. YORK stated, in reference to the lime light, that he had recently received a communication from Mr. Hardwich, who had, after testing the matter carefully, found that there was no difference between the commercial chlorate of potash and the pure preparation recommended by the Pharmacopœi so far as the yield of oxygen was concerned. The light produced was also exactly the same, and the only advantage the pure chlorate of potash had was that there was no smell of chlorine. This was, however, of little consequence when the difference in the price was considered.

The PRESIDENT then invited discussion on the gelatine process, the debate on which, arising out of the Paget prize award, had been adjourned from the last meeting.

No member being prepared to offer any remarks,

The PRESIDENT went on to state that the Council had that night decided to award the Progress Medal to Mr. Willis for his Platinotype process.

The proceedings then concluded, and the meeting adjourned.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE annual lantern meeting of this Society was held on Thursday, January 6th, in the large room of the Society of Arts, Adelphi, the Rev. F. F. STATHAM, President, in the chair.

The large room was well filled by the members and their friends.

There being no business of the Society to transact, after the Chairman had, in a few words, alluded to the object of the meeting, a large number of slides, by Mr. F. York, were exhibited, of the cathedrals of England. Slides were also shown by Messrs. W. Brooks, F. Howard, Payne Jennings, G. F. Williams, J. Nesbitt, W. M. Ayres, &c. Mr. W. England also showed several slides of statuary with a painted curtain. The effect of the tinted drapery around the white statues was very striking.

All the slides exhibited were exceedingly good, and showed how useful such a meeting once a year is, when members have the opportunity of exhibiting slides made from their work during the past year.

In the course of the evening a comic set of painted slides was exhibited, entitled "Tommy's First Photo.," the tale being read by Mr. Lewis Novra. After seeing the fine examples shown alone by photography, the coloured slides had scarcely an agreeable effect. Mr. C. G. Cutchey kindly provided and superintended the working of the lantern.

A vote of thanks having been passed to the gentlemen who had contributed slides, the meeting adjourned.

Edinburgh Photographic Society.

The third Ordinary Meeting of the Society was held at 5, St. Andrew Square, on the evening of Wednesday, the 5th inst. In the absence of the President the chair was occupied by the junior Vice-president, Mr. James Howie.

The minutes of the last meeting having been read and approved of, the following gentlemen were unanimously elected ordinary members:—James Archibald, Robert Cox, James P. Gibson, George S. Ferrier, James Steel, Councillor John White, Thomas Balfour, Thomas Maclagan, William Toddie, John Macintosh.

The first business of the evening was an open discussion on the subject of—"What is the best mode of Toning Transparencies?" Mr. Mathieson opened the discussion by stating that he had tried toning his transparencies both with gold and platinum, but he had not succeeded in getting tones to his entire satisfaction. He would like to get suitable tones for different classes of subjects; cold tones, for instance, were, in his opinion, the most suitable for seascapes, whilst for a certain description of landscape subjects a warmer tone might be considered more desirable.

Mr. Howie thought the usual way of exposing with the ordinary wet plates, and developing with acid pyrogallic, gave very good results, and required no toning whatever; but if one wished to do so, a flow of mercury or gold gave a very fine tone.

Mr. Pillans said he had found the best way was to tone in the ordinary toning solution for prints, as they became black in three or four seconds, and when finished resembled transparencies done by Mr. Wilson of Aberdeen. He did not think the tone made any difference on the screen, but was more pleasant to the eye when looked at in the hand.

Mr. Brown thought carbon transparencies answered the purpose very well; his own experiences in this direction were generally successful, and gave satisfactory results.

Mr. Briglmen said that the only objection he had to carbon was, that when printed light enough for the lantern, there was no depth in the shadow.

Mr. Moffat considered that carbon answered very well for transparencies for enlarging purposes, but for the lantern he did not think it quite suitable, for unless the negative was very soft, the high lights were apt to wash away in the development. Transparencies in carbon, he said, could be toned with permanganate of potash.

Mr. Mathieson remarked that he found transparencies that had been toned with permanganate were not reliable, as they soon lost their colour; the plates he preferred making transparencies with were collodio-bromide.

Messrs. Muir, Dobbie, and Neilson also took part in the discussion. The latter gentleman remarked that the discussion had brought out the different views of the speakers on a subject that was interesting to a large circle of amateur as well as professional photographers; and he thought that discussions of this kind were calculated to advance the interests of the Society's operations in practical work.

The Chairman offered a few remarks on "open discussions," and expressed the hope that they would become an interesting feature at many of the ordinary meetings.

The second item on the billet was, that a series of views would be shown by Mr. Robert Murray of his "Last summer's work in dry-plate landscape photography." The pictures, which were of excellent quality, were passed round the room and greatly admired.

Mr. Ranken said he had never seen anywhere such a collection of views so equal in tone and artistic in effect, and begged to move a hearty vote of thanks to Mr. Murray for his kindness in showing them to the Society.

Mr. Dobbie, in seconding Mr. Ranken's motion, made some observations on the character of the pictures exhibited by Mr. Murray, and directed particular attention to two of the views, "Invercauld, Braemar," and "On the Garrawalt, Balmoral;" these he considered were perfect gems, combining, as they did, the two elements of artistic effect and manipulative skill, equal in many respects to the beautiful productions of the most celebrated professional landscape photographers.

Mr. Neilson complimented Mr. Murray on the successful result of his last summer's work; several of the pictures were very fine, and all of them showed that Mr. Murray knew how to place his camera in order to secure the best artistic effect in his pictures.

Mr. Mathieson next showed a series of transparencies in the lantern. The subjects consisted of various kinds: landscapes, in some of which were introduced remarkably fine portraits of cattle, sheep, &c; seascapes, in which instantaneous views of vessels were seen; also some very characteristic pictures of fishermen and fisherwomen at their daily occupations. The exhibition wound up with a beautiful picture of the *Livadia*, taken while passing down the Clyde at full speed; this picture was taken by Mr. James Paton, Greenock, a member of the Society, and kindly sent by him to the Secretary for exhibition.

A vote of thanks to Mr. Mathieson terminated the proceedings of a very enjoyable evening.

A photograph of Daguerre, from a Daguerreotype, by Mr. J. E. Mayall, taken in 1846, was also presented to the Society by Mr. H. Baden Pritchard, of the News.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting of this Association was held at the Museum, Queen's Road, on Wednesday, the 5th inst., Mr. T. Davey, Vice-president, in the chair. The minutes of the previous meeting having been read and confirmed, Messrs. H. Carey Clives, C. Phipps Lucas, W. H. Pearson, Joshua Lamden, and H. Wyard, were elected ordinary members of the Association.

The Vice-President then called upon Mr. Brightman to read a paper on "Gelatine Plates and Restrainers," by Mr. H. A. H. Daniel, the Hon. Secretary of the Association (see p. 16), who, having an important engagement, was unable to attend the meeting and deliver his paper personally.

The Chairman remarked that it was hardly doing justice to the gelatine process to institute comparisons with the wet, and to point to defects of the former as inherent to the process. Though a considerable proportion of the pictures produced on gelatine plates were wanting in gradation and harmony, as stated in the paper read, it was admitted that others were nearly perfect, thus proving clearly that the *process* was capable of giving good results. Their knowledge of the gelatine process was of comparatively recent date, whereas their acquaintance with the wet process dated back many years, during which they had gained knowledge of its peculiarities, and had adapted their method of working to its requirements.

Mr. Brightman fully endorsed the remarks of the Chairman, and considered that a more extended knowledge of the process was required to fully develop its capabilities before comparing the results of gelatine plates to the results of the wet process, when the method of working it (the wet process) is not properly adapted to the class of subject in hand; and felt fully convinced that when we have had as many years' experience in the working of gelatine as we have already had with collodion, we shall understand better the requirements of the process, and no doubt produce pictures fully equal and probably superior to anything produced by wet collodion.

Mr. Davey remarked, as an instance of the latitude of exposure admissible with gelatine, that when first experimenting with these plates he had given exposures of five seconds and ten seconds without any appreciable difference in the resulting pictures.

Mr. Brightman, while admitting that considerable latitude of exposure was admissible if the developer were so varied as to suit the different lengths of exposure, did not consider the process, *per se*, with a given standard developer, admitted of much variation of exposure. He had exposed plates with a binocular camera, giving one half the plate five seconds, and the other half thirty seconds, the resulting pictures showing but little difference; but in this case the developer had been varied to suit the relative exposures in the respective halves of the plate. Had the same developer been used with both halves, one picture or the other must have resulted in utter failure.

Mr. Powell had experimented both with pyrogallic and the ferrous oxalate developer, and considered the former as admitting of far greater latitude of exposure than the ferrous oxalate.

Mr. Brightman remarked that he fully agreed with Mr. Powell.

The use of colloeine, as recommended by Mr. Daniel in his paper' would give the power of restraining development; but, when, using pyrogallic as a developer, we had the power either of accelerating with ammonia, or restraining with a bromide, thus getting a double advantage, being able to correct errors arising from over-exposure or under-exposure; but with the ferrous oxalate we had the power of correcting errors arising from over-exposure alone.

Mr. Davey considered that with ferrous oxalate development, judgment and the use of brains were required mainly in an accurate timing of the exposure; but in the case of pyrogallic development, the brains and judgment of the operator were more called into use in the development of the picture.

Mr. Brightman remarked that certain makes of plates admitted of greater variation in exposure than others, and had found as a rule, that those plates which developed slowly allowed more latitude than others which developed rapidly, and thought that the most perfect results would be obtainable with plates in which development and intensification formed separate operations; instancing the superiority of wet plates developed with iron, and afterwards intensified, over those in which development and intensification were simultaneous, as with the old iodized collodion and pyrogallic development.

The Chairman then called upon Mr. Brightman to read a paper "On the Use of Tannic Acid as a Preventive of Frilling and Blisters" (see page 21.)

Several gelatine negatives were then passed round for inspection, those which had not been immersed in the taninn being entirely spoiled by blisters and frills, the others from the same batch of plates, and which had been subjected to the action of the tannin, being entirely free from these defects.

The Chairman remarked upon the clear and conclusive nature of the experiment with the leather, and inquired whether the negatives had been developed with pyrogallic acid or ferrous oxalate.

In reply, Mr. Brightman stated that all the plates were developed with pyrogallic acid, as any developer containing an iron salt would immediately combine with the tannin, forming a compound very similar to ordinary writing ink, of course entirely spoiling the plate with inky stains.

A vote of thanks to Mr. Daniel and Mr. Brightman for their communications brought the meeting to a close.

Photographers' Benevolent Association.

This Association held its monthly Board of Management meeting on the 5th inst., at 181, Aldersgate Street, E.C.

The minutes of the previous meeting having been read and confirmed, Mr. C. G. Collins was proposed and duly elected as a member of the Association.

The accounts for 1880 were then submitted to the Board, and it was decided to hold the Annual General Meeting on Thursday, January 27th, at 8 p.m. All members of the profession, whether members of the Association or not, are cordially invited to attend this meeting and discuss the prospects of the Association. It is sincerely hoped that should they do so, it will be the means of largely augmenting the strength of the Society.

Assistants (for whose benefit the Association really exists) are urgently requested to give the subject their serious consideration, and attend the Annual Meeting, which will be held at 181, Aldersgate Street.

Talk in the Studio.

A Clever Capture.—An audacious robbery and attempted murder was committed at a private hotel in Paris, and the culprit has been discovered and arrested in a manner which reflects great credit on the police. The victim was an old lady named Madame Gouye, who kept the Hôtel des Amis des Arts, and who was discovered early one morning insensible, and with a severe wound on the head. From this state of unconsciousness she has been very slowly recovering, though not able to speak, and scarcely capable of noticing those who were around her, including an agent of police who never left the room, in the hopes of Madame Gouye being sufficiently sensible to give information as to her assailant. The first revival took place one morning, when the sufferer was heard to murmur the word "Léonce." This slight clue was enough to send the agent to the Prefecture, where are kept the photographs of all those who have been brought up by the police for criminal offences. The portraits were examined, and at length one was found with the name of Léonce at the back. It was taken to Madame Gouye's apartment until such time as the old lady might be roused sufficiently to notice things. The opportunity arrived, the sufferer opened her eyes, and the photograph was passed before them, when a distinct recognition took place, though but momentary. This, however, was enough for the police; the photograph was copied, and every agent in Paris was made acquainted with the likeness; and in two or three days' time the owner of the portrait was arrested on the Boulevard St. Martin, when he made a full confession of his crime.—*The Times.*

To Correspondents.

⁂ Letters from W. M. Crouch, J. S. Tulley, and T. G. Whaite are postponed till next week.

A Subscriber.—We do not think it is published yet, but see page 222 of last volume. Anything new we shall be sure to tell our readers.

W. P —Robinson and Abney; in a few weeks. It will contain chapters on art printing, as well as on all technical matters. The Emulsion book is 1s. 6d.

F. Francis.—We do not think that there is any book on the subject, but the matter is so simple that there is no reason why you should not obtain the materials and make a beginning. In such a matter, the experience of a couple of days' work is worth volumes of printed instructions; you will, however, find papers on the subject in back volumes of the News.

Geo. Tuohy.—The print was duly received, and we congratulate you on the result. No doubt much is to be done in the line you have struck out, and we shall be pleased to be informed from time to time as to the results obtained.

A Frame Maker.—Any manufacturer of wood-workers' tools will supply what you require, although it may have to be made to order.

Anxious.—1. We never heard of the discoverer in question being elevated to the peerage, although he may have well deserved the honour. 2. A Daguerreotype which has become tarnished by keeping may be restored by the application of a weak solution of potassium cyanide—say one part in thirty or forty of water; after which it must be well rinsed and dried. If, however, your picture looks "more like a mirror than anything else," it is probable that there is very little of the image on the plates.

X. Y. Z.—We do not know anything whatever of the patent you mention; but it seems to us that a patent for making them of any particular colour can hardly exist.

Sulphuric Acid.—A series of articles on the production of the various kinds of ferrotype pictures will appear shortly in the News. The formula you allude to is culled from an American source, and it is well-known that our trans-Atlantic cousins go in for strong preparations; but surely there must be a mistake in the present instance.

C. and D.—Obtain Captain Abney's manual, and, after you have carefully studied it, practise the collodion and gelatine process until you have overcome technical difficulties. After this, you will be in a position to make arrangements with some photographer of standing, to enable you to study the artistic aspects of portraiture. Do not expect to become an accomplished photographer with extreme rapidity, but work patiently. Your previous training as a chemist and druggist will help you considerably.

A. C. M.—1. Possible, but hardly practicable. 2. Perhaps as one and twenty; but each being variable, this is only a rough estimate. You will, however, find that a good lime light will suit you best.

N. T. A.—The only material which will not cause any expansion at all is the india-rubber paste or solution, which is sold ready for use in tins. Moderately thin glue is, however, a much preferable mountant, as, if used skilfully, it causes a minimum of expansion, and the adhesion is perfect. Care must be taken that the glue employed is of good quality and free from all trace of putridity.

Colorist.—No preparation is necessary in the majority of cases, although some prefer to "prime" the surface with a medium sold for the purpose—this being, in reality, merely an extremely attenuated oil varnish.

Sempronius.—Too much top light. As your studio is situated, your only alternative appears to be a series of mirrors placed outside, at such an angle as to throw some nearly horizontal light into your studio.

L. Lonsdale.—Had you not better try the experiment? Others have, however, worked in the same direction without any very successful results.

T. M. I.—The process and results are most interesting. Many thanks for your letter.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1168.—January 21, 1881.

CONTENTS.

	PAGE
Frost and Photography	25
On Adding Nitrate of Silver to the Bromide in a Gelatine Emulsion	25
Spots in Gelatine Dry Plates	26
The Sensitiveness of Chloride of Silver Emulsion. By Dr. J. M. Eder	26
At Home	27
Photography In and Out of the Studio	28
The Ferrotype: How it is Made. By W. Heighway	29
Notes	30
Topics of the Day	31
On Improving the Setting Properties of Gelatine Emulsion. By W. K. Burton	32
Prints from Old Negatives. By the Author of "Looking Back"	32
Dr. Vogel's Emulsion	34
Correspondence	34
Proceedings of Societies	35
Talk in the Studio	36
To Correspondents	36

FROST AND PHOTOGRAPHY.

The hard weather of the last few days has not only frozen-out the photographer in many instances, but has also gone far towards freezing-in his best customers—indeed we beg pardon—clients. Perhaps it is as well that both events come together, as the sight of a waiting room full of would-be sitters might cause the photographer to mutter some indistinctly articulated words when he turns towards his frozen water-pipes and the wreck of his distilled water bottle. Photographers are, however, tolerably used to untoward circumstances, and seldom spend more than a few seconds in vain and idle expressions of grief. The dry plate man can afford to laugh at the frost, as he may expose his plates and adjourn development until circumstances be favourable. He, however, must look to his lenses, as the brass mounts are often so closely fitted round the glasses that any unusual degree of cold serves to contract the metal rim and distort the lens so much as to render it practically useless. A lens should always be so easy in its cell as to just turn round when brought under the influence of thumb and finger; and in cold weather the lens ought to be always a few degrees warmer than the surrounding atmosphere, lest any moisture from the body should condense on its surfaces; and in the case of an outdoor run with the camera during snow time, the objectives should be buttoned up in an underneath pocket. Any moisture which may condense on the glasses under these circumstances very soon flies away when the warmed instrument is brought into the dry frosty air. Exposures are often surprisingly short when the snow is on the ground, ordinary instantaneous work being often quite practicable; and well-exposed snow pictures possess a charm which is quite their own.

The wet plate worker has more difficulties to contend with, as he must not only look to his lenses, but must also observe numerous precautions in working. It is necessary to warm the glass plates, or moisture from the hand would be liable to condense on them, and this being distributed by the cleaning rag would tend to give rise to streaks and markings of various kinds. Then, again, a considerable time must elapse before immersing the collodionised plate in the bath, and unless the bath itself has been warmed, the usual double decomposition does not take place rapidly and perfectly, the resulting plate being correspondingly slow; while in development the sluggishness of action resulting from a low temperature is even more pronounced than the want of sensitiveness resulting from the use of an over-cold nitrate bath.

The wet plate man need not, however, despair of obtaining out-door views of snow scenes, provided that he has only the pluck to go out; as we remember obtaining some very successful negatives when the cold was so great as to freeze the bath solution on the surface of the plate immediately it was placed in the slide. In this instance we merely washed the developer off with a solution made up like an iron developer *minus* the iron, and postponed intensification and fixing till our return to the laboratory. Strangely enough, the crystallization of the bath solution on the surface of the plates produced no effect which was traceable on the finished negatives. The addition of glycerine to a silver bath is not always satisfactory, as most samples of glycerine contain sufficient traces of impurity to work mischief.

The silver printer must bear in mind that a longer time must be allowed for sensitising and fixing than is required during warmer weather, and it is as well to employ a somewhat stronger toning bath than that generally made use of.

This frosty weather is a glorious time for the carbon printer—that is, if his tap is not frozen up—but he may think himself fortunate if he escape the unpleasantness of chapped hands and a more or less severe cold.

◆

ON ADDING NITRATE OF SILVER TO THE BROMIDE IN A GELATINE EMULSION.

We—as, no doubt, many others have done—have tried the method given by Mr. Wilson for the preparation of gelatine emulsion, and with perfect success. It will be in the recollection of our readers that Mr. Wilson, who gained the Paget prize, recommended the addition of a little hydrochloric acid to the gelatine, in order to produce a trace of chloride of silver. As regards this point we may observe that the formation of the bromide will invariably take precedence of the formation of the chloride, and it appeared strange to us that it should, as he claims for it, give a fine grain to the emulsion when a quantity of nitrate of silver is added at the outset to the bromized gelatine. As to the practical value of the hydrochloric acid we can give no positive confirmation, since we have found that our method of working was equally effective, whether the hydrochloric acid were present or not, and it is this we propose to describe.

We will suppose that at the outset we are going to prepare the emulsion by boiling with a small quantity of gelatine, and that our gelatine and bromide is warmed and in solution, and placed in a bottle capable of holding at least three times the amount of fluid which will eventually be in it. If now (say) a drachm of silver nitrate solution be added at once, it will be found that a coarse precipitate results, which is particularly visible after boiling, and will be left behind in the filter. If, however, we proceed somewhat differently, and commence by making the gelatine into a froth by shaking the bottle vigorously for two or three minutes, and then add the drachm of silver nitrate, giving a subsequent shaking to the bottle, we shall find that the coarse particles are absent, and that, in fact, after boiling there is no residue left whatever. After the first addition of the drachm of silver nitrate solution, it does not seem to matter very much if larger quantities of it are added at one time, since the shaking after the addition of the first quantity increases the density, so to speak, of the froth, and the new quantum of nitrate of silver has a great difficulty in seeking out, as it were, the bromide in the thin films of the bubbles which, in the aggregate, make up the froth.

With iodide in the emulsion, the same mode of procedure may be adopted with a like result, and by this means we are able to abolish the different spray apparatus, which are a great nuisance at any time, and more especially if one is in a hurry. It almost seems as if the method we recommend came back to the old collodion bath process, where we have thin films containing soluble iodides, &c., exposed to the action of nitrate of silver, and which, we know, gives very fine granulation to the silver salt contained in them. Our plan avoids the necessity of adding the soluble iodide to the emulsion after part of the bromide of silver is formed, and thus does away with one operation, and the fewer there are the more conducive it is to the comfort of the photographer and the popularity of the process. With emulsions made by this method we have observed the same sensitiveness as produced when the spray apparatus is used; and, moreover, there is the same trace of yellow in the films by transmitted light, which we are told is a test for their goodness and capacity for giving density.

SPOTS IN GELATINE DRY PLATES.

In preparing gelatine dry plates, "plague spots," brown and grey, transparent and opaque, come like an epidemic when least expected, even though precautions have been taken to dust and disinfect laboratory and drying room. On the other hand, batch after batch of plates are prepared and show no symptom of the disease. The eruption has broken out so freely in some quarters as to cause a sort of panic and rush upon gelatine makers. A careful examination of the plates enables one, in some cases, to diagnose or "spot" the cause of the disorder; in others this is impossible without knowing the precise conditions under which the emulsion was made and the plates were dried. We are certain of this, with suitable brands of commercial gelatine, under a proper system of working, spots should not appear.

In selecting gelatine, an initial experiment should be made, in order to find out whether it will set without pitting. This is done by swelling thirty grains of gelatine in one ounce of water, dissolving, filtering the solution, coating a plate, and allowing it to set on a level glass slab. But to secure the film against dust it should be protected under a sheet of muslin stretched upon a frame. If the gelatine be suitable, the surface when set will be free from pits. Should it show the slightest symptoms of pitting, it ought to be discarded, as the evil is only intensified by subsequent cooking.

Nelson's No. 1 photographic gelatine generally fulfils the required conditions. The French gelatines, as a rule, are much harder, and less liable to frill, but they are not so free from spots. Some of the flake gelatines contain a small percentage of grease; in others, grease sufficient to spoil an emulsion is deposited on the flakes by the netting in which they are dried, or by frequent handling.

In the latter case, grease may be removed by washing with alcohol eight parts, ether two parts. When the impurity is bound up in the flakes, the material should be cut up, swollen in water, dissolved, and precipitated in alcohol by Abney's method. The safer plan is to select a gelatine free from pitting.

It is possible to prepare a thoroughly trustworthy article of this sort, and the demand would amply repay the care bestowed by the gelatine manufacturer. But, making use of such gelatines as are in the market, when a selection has been made, the gelatine should first be washed in water not exceeding 60° Fah. The washing should continue for two or three hours. By this means soluble impurities are eliminated. When dissolved, the solution should be inodorous and tasteless, as any taint in its composition bodes ill for emulsion making.

Should spots appear in plates prepared with gelatine so selected and treated, the cause of the eruption must be sought for in another direction. In our own experience, plates prepared with what was considered a suitable gelatine have yielded a crop of spots of various dimensions. When the gelatine is not at fault, attention should be directed to the jar in which emulsification was effected. It should be either a jar of well-glazed white porcelain, or a glass beaker containing no trace of a former emulsion. Small particle of emulsion that have been exposed to light, left clinging to the jar, would mingle with the new preparation, and cause spots. The same danger appertains to the washing trough, and to the netting through which the jelly was divided into shreds.

If the netting be of a loose texture, it is almost certain to imprison particles of emulsion, which should be destroyed by boiling in an alkali. A netting of silver wire fixed to the end of a glass syringe carrying a piston may be used with safety for dividing an emulsion before washing.

But, apart from the necessity of absolute cleanliness in this part of the process, mechanical impurities in the emulsion should be got rid of by careful filtration. When every precaution has been taken, so far, the method of drying will account for a variety of spots, caused by dust settling on the film. When plates are dried in a room having free circulation of air obtained by means of heat, every precaution should be taken to exclude the ingress of dust with the cold currents from the outside. Spotty plates examined under the microscope, when the spots are caused by dust, disclose a nucleus in the centre of each spot. In some, the small particle of matter has proved inert, while in others, organic. In the latter, a process of decomposition has been set up, and its spread only arrested by the drying of the film. Some of the particles appear to be fungoid in character. During damp weather, when mouldy gelatine may have been left about, or when walls become mouldy, and the fungi thus obtained give off spores, these are carried in the air, and find conditions fitted for their growth in the moist gelatine film as with germs of decomposition in an impure atmosphere; hence the benefit of employing an antiseptic in the preparation of emulsion.

Gelatine emulsion plates that have been used, and imperfectly cleaned, cause spots. In preparing plates, sheet glass having grit imbedded in its surface should be avoided. In any case, in order to secure a film free from defects, the smoother side of the glass should be coated.

THE SENSITIVENESS OF CHLORIDE OF SILVER EMULSION.

BY DR. J. M. EDER.

I have to thank Mr. Barker for calling attention to a serious error in my last article, although it is but an error of the printer or translator. In the article in question, I am made to say that "the chloride of silver receives equally the latent image during the exposure necessary to bromide of silver." It should have been "*not* equally."

I can to-day, fortunately, say something more in respect to the sensitiveness to light of chloride of silver. I am not permitted to make known in detail the particulars of a memoir which Captain Pizzighelli and I have submitted (on the 13th January) to the Imperial Academy of Vienna, until, this is published; still the differences between Mr. Barker and myself tempt me to allude to one or two points therein.

We have found, then, that gelatino-chloride emulsion, under the most favourable conditions, requires from forty to sixty times as much exposure as bromide of silver, in order that a well-exposed picture may be produced. If a chloride film be exposed for the time necessary for the production of a picture upon a bromide film, only the high lights of a latent image are produced upon the chloride.

Further, we found that the least trace of a soluble bromide in the developer alters in a most extraordinary manner the behaviour of chloride of silver under development Even one hundredth of a per cent. of bromide of potassium retards development in a most marvellous manner.

The result of our investigation was to divide developers into two classes:—

1. The developers for bromide of silver were all powerful reducing agents (ferro-oxalate, &c.).
2. The developers for chloride of silver all belonged to the weaker reducing agents (ferro-citrate, &c.).

As a general rule we found that the whole group of developers suitable for bromide of silver were unsuitable for chloride of silver development, because the former reduced with too much energy—and, indeed, acted more or less upon the chloride of silver, which had not been impressed by light.

It is possible, it is true, to develop an image upon chloride of silver with alkaline pyrogallic, or with oxalate, but it will be a very bad one. It is necessary to add bromide of potassium to prevent fogging; although, even then, this defect cannot be altogether avoided. By quick development, the fogging is less, but then *only* the most intense lights will appear. In all these cases, nevertheless, chloride of silver is much less susceptible of chemical development than bromide of silver.

I must here repeat that a chloride of silver plate under development (alkaline pyrogallic, or oxalate) leads to the formation in a short time of soluble bromide, which has its influence in the developing process.

The action of chloride of silver in chloro-bromide emulsion is a subordinate one, and, as regards sensitiveness to light, its action is as good as *nil*. Nevertheless, the greater rapidity with which it is reduced *chemically*, and *not photo-chemically*, may have the effect of rendering the negative somewhat softer. This action is to be ascribed to the reduction of the film over its whole surface, which has been affected by light.

Exactly the same reduction and the same softness can be speedily imparted to pure bromide of silver. It is only necessary to add to the alkaline pyrogallic developer a little more ammonia, and a little less bromide of potassium, in order to secure this result. Very shortly I hope to communicate more upon this subject, from the investigation made by Captain Pizzighelli and myself.

Finally, I must add, that I think Mr. Barker is in error when he states that most bromide emulsions contain chloride of silver without the latter having been *intentionally* introduced from the chlorine contained in gelatine, in impure bromides, &c. I do not think so, for gelatine emulsion is always made with an excess of bromide. It is true the excess is often but slight; but the least excess of soluble bromide, it must be remembered, prevents the formation of chloride of silver, and, notwithstanding the presence of soluble chloride, only pure bromide of silver results. The *accidental* production of chloride of silver is therefore scarcely likely to take place in practice.

At Home.

AT PENTONVILLE PENITENTIARY.

A very mistaken notion prevails upon the subject of photographing prisoners. The popular idea is that the prisoners themselves are very unwilling to submit to the ordeal, and usually make all sorts of difficulties and disturbances, sometimes not easily over-ruled. Strange accounts have been published of cunning devices and ingenious tricks practised upon convicts in order to secure a photograph of their features; and we remember seeing, not long ago, a talented picture, the subject of which was an unwilling sitter maintained in position by a couple of stalwart warders, while the photographer did his worst or—rather his best. Such representations work, from the nature of things, a marked impression upon the public mind, and hence is due the impression that the photographing of prisoners is peculiarly troublesome and difficult. But it is the exceptions that the public hear about, and not the ordinary operations.

No doubt obstreperous criminals are met with, from time to time, and no doubt, too, the photographer has often his work to do over and over again; but some little experience has shown us that a more docile body of sitters than our convicts do not exist. We do not say this because, as photographers, they are easily satisfied—because they never offer a remonstrance or suggestion—never ask to see the negative—and, above all, do not importune for a second sitting. But, so far as we have seen, they sit quieter and steadier, and are more ready to fall in with the exigencies of photography, than are their brethren in freedom.

Pentonville Penitentiary is the largest establishment of the kind in this country. At the time of our visit there were eleven hundred prisoners within the walls, and a much larger number can find accommodation if necessary. Every man sentenced to penal servitude comes to Pentonville, and the first nine months of the period of his conviction he passes there. It is during this period that he is photographed, and the photographic records of Pentonville thus include every man in the kingdom sentenced to penal servitude. There is the same strict watch and vigilance at entrance and lodge which we described as existing at Millbank. There is the same military discipline among the warders—the same grey monotonous appearance about the prisoners. Millbank had ivy and shrubs as its principal ornament: at Pentonville, it is the green grass plots upon which the prisoners rest their eyes for relief.

So that these green spots may exist within the tall sombre walls, grass is grown in the exercise squares, and circular paths of asphalte, some two feet wide, appear like gigantic rings one within the other. The prisoners are at exercise at this moment, and we can see them from a window in the Governor's room, walking round and round the green—an outer circle and an inner circle of them, a warder on a raised platform looking on. The men are closer together than at Millbank, and step out with military precision, and for the most part with jaunty air and elastic step; some even smirk and smile as they catch sight of us at the window; swinging their arms and wagging their heads, there are not half-a-dozen who appear dull or dejected. Perhaps it is the bright sunshine that pours down upon them in their roundabout tramp. One poor fellow walks to and fro in a corner by himself; he has a wooden leg, and cannot keep up with the brisk march of his fellows.

On our way to the studio we pass through the central hall of the prison, the lofty white walls rising sixty or eighty feet on either side; tiers upon tiers of cells, having access to light iron galleries, one over the other, run the length of the hall, which is spanned at intervals by iron bridges. Warders are posted everywhere, in vestibule, gallery, and bridge. We look into one of the cells; it measures, perhaps, 12 feet by 8 feet, and contains a hand-weaving machine, at which the prisoner works. The cell is whitewashed, is very clean, and lightened by a window some nine feet high.

The Governor is good enough to show us the tailoring shop, the shoemaker's shop, the laundry, the infirmary (where a dozen poor fellows are lying in bed, but as comfortable, apparently, as they would be in any hospital in London), and the kitchen, where huge boilers and stewpans are all attended by convicts. It is suet pudding day to-day, the only day in the week when there is no meat; but the Governor says it is a favourite meal, for all that, and we are invited to taste the pudding—a pound block like a tinned loaf—which is made of whole flour, and served with the same weight of potatoes.

Universal silence reigns everywhere—in kitchen, workshop, and yard, for a prisoner is reported if he so much as opens his lips. During the whole of his sentence he is forbidden to speak to any one but the warders, and these, as we enter, salute the Governor, and immediately call out their brief report without waiting for any invitation to do so.

The photographic studio is on the second floor of a solitary building in one of the yards, and has been built by some one possessing a knowledge of photography. The days are long since gone by when a wooden bench in front of the prison wall was the only convenience at the photographer's disposal. The glass room is, however, far from perfect, for not only is the aspect faulty, but the skirting-board rises too high to permit of a good side light. Indeed, when the prisoner sits down to be photographed, the line of light from the side is above his head. The consequence is, the top half of the studio is very light, where the sitter is not, and the lower half, where the sitter is, is, comparatively speaking, in shadow. But Mr. Mackay, who is at present entrusted with the work of taking portraits, is fortunately clever enough to combat with some success against the existing drawbacks, among which may also be cited apparatus that leaves something to be desired.

Six convicts file into the studio attended by a warder. They remove their caps, and sit down in a row on a form; in grey jackets and knickerbockers, with shaven faces and cropped hair, they look like big school boys. One of them takes up a narrow black board, some six inches wide, and proceeds to write very neatly in chalk the number and name of the first sitter, the board being then placed above the man's head when his picture is taken. He sits on a high-backed chair, and with no head-rest, remains perfectly still for the seven seconds the exposure lasts. "Look at those bottles in the corner," says Mr. Mackay briefly, so that the man may turn his head a bit, and then the lens is uncapped. A double carte plate is used; but the men are so steady that rarely is a second negative taken; another convict takes the seat, and the narrow black board above the head is reversed, the back bearing the second man's name and number.

While the double plate is being developed, and another put into the slide, there is time to clean the black board, and put upon it two other names. There is no speaking; the convict simply pulls out of his jacket pocket a wooden tablet bearing name and number, and this is copied.

"Look at those bottles," cries Mr. Mackay, rather sharply, to his next sitter, for the man has not heeded the first request, "and put your chin down." The sitter smiles faintly, but does not obey. Ah! here is a refractory prisoner at last; we are glad of it, for we shall be able to see how matters are managed. But we are disappointed. "He is deaf," says the warder, who no sooner comes forward and explains to the sitter, than the latter is all obedience.

According to the regulations, every prisoner's head should be depicted an-inch-and-a-quarter in length, but this is only taken as an approximate size. Mr. Mackay does better than measure the head every time; he takes every one of the same proportion, that is to say, the distance between lens and sitter is always the same, and is never varied, a measuring rod at once regulating the interval. In this way, a much better idea of the size of a man's face and features is obtained than if large heads and small were all depicted of the same dimensions.

It is necessary to produce rather hard negatives, otherwise it is almost impossible to secure contrast of any kind. The men being shaven and shorn, they present little contrast in themselves, while the dress they wear, being of a dull grey and with few folds, makes but a poor monotonous result if the negative errs on the side of softness. Under any circumstances, with the black board and its chalk writing above the head, the hands pressed close against the breast—for a picture of the hands is deemed as requisite, as we have said before, as one of the face, from the fact that they are so much an indication of the man's calling—and the ugly dress, a prison photograph can never be anything but a doleful result; but it is nevertheless satisfactory to find that the photographs, as photographs, have of late years been much improved.

Besides securing records of prisoners, the practice of photographing them has one other advantage. In itself it acts as a deterrent of crime. Every criminal is aware that a picture has been taken of him, and he never knows how much this may be the means of bringing him to justice if he relapses once more into evil ways. He is apt to over-estimate rather than under-estimate the power of photography, and it forms, at any rate, one reason the more why he should refrain from crime hereafter when he is again a free man.

Next week will appear the first of a series of articles under the title of BY-THE-BYE, on the subject of "The Status of the Photographer;" the "At Home" following will be "Mr. Léon Warnerke at Silverhowe, Champion Hill."

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE PAGET PRIZE—THE "DETECTIVE CAMERA"—THE PHOTOPHONE—THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

The Paget Prize.—It is an odd thing that, however much prizes given in schools may stimulate exertion, they rarely do so under other circumstances, and certainly, as a rule, never lead to brilliant discoveries. In music, the number of prize glees is legion—there is scarcely one which has survived to the present day. In art, it is quite an exception when the prize picture or statue is anything at all remarkable. In literature, the prize play—the play which gained the prize offered according to the will of Mr. T. P. Cooke, for example—does not rise beyond mediocrity; and the prize poem and the prize story are no better. Photography has not been much more successful than music, art, and literature. The prizes offered by the late Mr. Crawshay, a few years ago, had little result; and though we will not say this of Mr. Wilson's gelatine process, which has recently gained the Paget prize, it does not appear yet as if photographers have gained very much by Mr. Paget's liberality. The prize, it must be confessed, was offered the second time a little too late, for the manufacture of gelatine plates had already reached the commercial stage when the number of competitors would be naturally reduced, as a fifty pounds by many would be considered a poor equivalent for the divulging of a process. We hazarded as much some time ago, and the result has proved that we were right. But four processes were sent in, and the most successful—by a non-manufacturer—was declared in common with the other three to possess no exceptional or remarkable feature of excellence. Who the other competitors were we do not, of course, know, but we will venture to say that not more than one out of the three (if one at all) was a professional maker of gelatine plates. Now, remembering that there are at least a dozen commercial manufacturers of gelatine plates, all of good quality, the indifference they have shown to this prize is very significant.

The "Detective Camera."—It is a pity Mr. Henry Blackburn, who gave a lecture last week at the London Institution upon "The Possibilities of Illustrations in Books and Newspapers," did not know of the "Detective Camera" of

Mr. Bolas, or he might have made his remarks much more complete. Mr. Blackburn seems to be of opinion that reporters should also be artists, and "by means of a few rapid and skilful strokes upon the blackboard he showed, apparently to the satisfaction of the spectators, that the descriptions of a special correspondent to a newspaper might be rendered much more graphic by the use, in the right place between the printed lines, of a system of pictorial representation." How this is to be done is not very clear; certainly a "pictorial representation" between the lines of an ordinary newspaper would not only require a microscopical eye, but also a microscopical pen. From his subsequent remarks, Mr. Blackburn, however, anticipates the time when every daily paper will be illustrated, though these illustrated papers will be very different from those to which we are now accustomed, which are "more devoted to the making of pictures than to the veracious chronicling of actual facts." If Mr. Blackburn be correct in his surmise, there is a grand future for Mr. Bolas' camera, and he had better patent it as soon as possible. Photography is alone capable of "veracious chronicling," and no special correspondent will be considered properly equipped unless he is also provided with his detective camera. By the way, the authorities at Government establishments, who are very strict on the point of sketching, must beware of these cameras. What is to prevent the intelligent foreigner, armed only with an inoffensive leather bag, taking a photograph of fortifications, patent processes, or anything else he desires to know something about?

The Photophone.—Some name other than the photophone will have to be found for Professor Graham Bell's curious apparatus if the opinion of the French *savans* as to the cause of the musical sounds be a correct one. The latest theory is that the sounds are due to heat, and not to light, and "radiophonic notes," to use the new term, have been obtained by M. Mercadia from ordinary gas lamps, without employing lenses to concentrate the interrupted beam, by simply bringing the receiving disc near the source. A plate of copper heated to a bright red heat produced very distinct musical tones, which gradually died away as the plate cooled to a dull red followed by obscurity. It is undoubtedly a curious fact, and one that is adverse to the light theory, that when the receiving discs were coated with silver on the side next the light, the effects were feeble, and that when coated with absorbent lamp black, they were stronger.

The Photographers' Benevolent Association.—It is not very encouraging to hear whispers that the Photographers' Benevolent Association must die of inanition unless more liberality in supporting it be shown by the profession. Are photographers less benevolent than their fellow-men, or is it that they have put their hands in their pockets so often to relieve the wants of "out-at-elbow" individuals, that they scarcely feel called on to do any more? We will not seek to enquire the reason, but this we will say, that there is not a photographer who has not had a pretty large experience of the professional "cadger," who goes from studio to studio, and lives on the proceeds of his begging. Some years ago there was a seedy-looking fellow who did nothing but call upon photographers with a piteous tale that he was an artist unable to buy materials wherewith to colour a photograph which he had undertaken to do. Occasionally, to give a semblance to his tale, he would pull out a grimy carte, and generally extracted a sixpence or a shilling from the sympathetic photographer who could not refuse to give the distressed brother "a leg up." Of course, the existence of such impostors makes a Society which would inquire into their claims all the more necessary, and we really believe that if photographers gave to the Benevolent Association what they give indiscriminately, and perhaps to get rid of a pertinacious mendicant, the Association would not have reason to complain of want of funds.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

There is a peculiar charm about the ferrotype, all its own, which is gaining recognition very rapidly among us. It has been the fashion to sneer at the picture on iron; but just as similar objections raised to the carte-de-visite have been abandoned by *dilettantes* of art, so will those urged against the ferrotype be less loudly and less confidently uttered ere long.

So far from the ferrotype being inferior to the photograph from a negative, it may be safely said that in two important respects, at least, it is superior. The simplicity of the operations, and the rapidity and ease with which the pictures are made, inspire the sitter with confidence, and do not give occasion for thought of the matter in hand. There is, in fact, a free-and-easiness about the whole business which induces a pleasant expression and naturalness of position. From an artistic point of view, these are no mean advantages.

It is not, however, our intention to supply a *raison d'etre* for the ferrotype, but to give some concise and simple directions of working, and especially to strive for the introduction to the practice of the ferrotyper of those rules of art without which no branch of photography can attain to its full development.

For the "dark room," a place in, or immediately adjoining, the atelier should be provided. Here the plates are collodionized, sensitized, and developed. For this, a very small space is necessary, and waste room is a disadvantage. In a moderately large gallery, with two skylights, there might be constructed in the centre a dark room five feet square, and this would be ample accommodation. Such a room would not be in the way; and with a door on either side, entering from each light, would prove most convenient.

The dark-room is fitted with a tank of sufficient capacity to hold the washing from the pictures made during a day; a shelf for the developer and developing utensils, one for dark slides, &c., and another for the plates, collodion, &c. The sensitizing bath, and that containing the potassium cyanide for clearing the picture, may stand well apart in the dry trough of the tank, as will presently be explained.

The tank, or trough, over which the plates are developed, is an important accessory to the gallery. It may, by a very simple arrangement, be made to save all the waste silver, and will soon pay for itself, and, if properly used, contribute liberally towards defraying the expenses of the gallery.

The capacity of the tank should be sufficient to meet the requirements of the busiest day's work. Let it be made of well-seasoned wood, rendered water-tight by a coating of asphalte; resting on the floor, it should rise to a convenient height to develop over. A tray, about four inches deep, may be formed of a board perforated with holes through which the water will run into the tank below, thus leaving the tray always dry. In the side of the tank, about nine inches from the ground, a pipe is inserted, the inner mouth of which is bent down to about three inches of the bottom of the tank. On the outside of the tank the pipe is fitted with a tap. At night, the contents of the tank are treated to a small quantity of saturated solution of copperas, for the purpose of precipitating the silver in solution. In the morning, before work commences, the tap is turned on and the clear water run off, the tap being reversed when the tank is emptied to the inner mouth of the pipe, *i.e.*, three inches of the bottom of the tank, so that the rich deposit may not be disturbed. By this means, during working, all the washing water, waste silver, old films, &c., may be caught and retained in the tank. The silver is precipitated at night (the waste developer assisting in the work during the day), and in the morning the supernatent water is run off, and the pipe closed against the escape of the silver-charged water, which begins to flow into the tank as development proceeds in the work of the day. A first-rate silver-saving apparatus may be made of an old felt hat, bound firmly over a hoop. By developing over this, the greater portion of the waste is caught, the rest being retained in the tank.

In the dry trough of the tank, the sensitizing bath on one hand—sufficiently removed from the influence of developer splashings—and the fixing bath on the other hand, may be placed. Plateholders should have their place near the bath, and be kept closed, to guard them against dust, and the splashing of contaminating fluids.

Over the tank should be fixed a tap placed in a convenient position for use in development. A separate cistern should be at the disposal of the ferrotyper, as a steady flow of water is necessary.

The developer and pouring cups would naturally be placed conveniently to hand near the water-tap.

The shelf for plates and the collodion pouring bottles should be fixed near the door, so that the operator should have the benefit of the light.

The dark chamber, lighted either by gas or a window glazed with orange glass, should be sufficiently illuminated to render working easy and comfortable.

In the arrangement of every detail of the dark-room the convenience of the worker should be studied, as the work must be done with extreme rapidity. We have, therefore, to secure the greatest facility of working with the most perfect sureness.

The glass room should have two lights divided by a partition; one side may be then used, generally, for the ordinary styles of portraiture and interior compositions; the other for "rustic" pictures, groups, &c., so much time of preparation and clearing away being by this means saved.

The light required for the rapid ferrotype process should be well-directed, unobstructed, free from reflections, and of good quality. Quality not quantity, remember! We have still to learn that the best pictures and the shortest exposures are obtained by skilfully-directed illumination—not by flooding the gallery with light. With an awful expanse of glass, top, side, and nearly all round, over a great portion of which blinds are always drawn, good effects can only be obtained by the exercise of great skill, and after considerable experience of the light. The sooner the spare glass is boarded-up the better. The easier the light is to manage, the finer are the results obtainable by it.

For ordinary portrait work, the sloping side light has many advantages over every other form of light. The illumination is better directed, there is less obstruction of sashes and overlapping sash panes, it is stronger, more easily kept clean, and the arrangement of necessary blinds is much more simple. The glazed portion, of nine feet wide by seven feet high, will give ample illumination for any style of picture. The glass should not be nearer the ground than thirty or thirty-six inches.

Two sets of spring blinds should be provided—one drawing down from the top, the other up from the bottom, and meeting in the centre. Two or three widths may be used—three to be preferred. By this simple arrangement any required effect of light and shadow may be secured.

The combination side and sloping top, which has been a long-established favourite, is a very serviceable light, but—especially for the ferrotyper—is not so useful as the sloping side, for the reasons already mentioned. The arrangement of blinds is the same, drawing down and up to the junction of the top and side lights. The top light should have sufficient slope to allow the rain to readily run off.

Dark space, of at least three feet, must be left at each end of the light for backgrounds and accessories. This space cannot be dispensed with, as it is impossible to produce really artistic pictures if the light is allowed to wander all round the sitter.

It is also required that pictures may be made at either end of the gallery.

Notes.

Our readers will be glad to peruse the specification relating to Dr. Vogel's emulsion, which appears in another column.

We commence this week a series of articles on the ferrotype process, by Mr. W. Heighway, which will interest many of our readers.

Mr. Frank Buckland has left his Museum of Economic Fish Culture to the nation. Not the least important feature of this collection is a series of photographs of salmon, taken by the late Mr. Robert Crawshay, of Cyfarthfa Castle, illustrating the condition of fish at certain periods of the year, and demonstrating very clearly the time over which the close season should extend. The photographs were supplied by Mr. Crawshay, with notes taken from personal observation; and as Mr. Crawshay was as skilful a salmon-killer as he was photographer—which is saying a good deal—the pictures are exceedingly valuable.

Photographers are deeply interested in foggy weather, and should therefore be glad to learn that Mr. Cubitt, M.P., has given notice that he will shortly move for a return in Parliament showing the amount of injury to health that is due to fogs. When he has, in this knowing fashion, brought home to the fogs the full extent of their misdoings, he means, of course, to set about their extermination. Were we called upon to give evidence, we should pronounce the top of Ben Nevis to be more infested with fogs than any other region in these realms, and we trust Mr. Cubitt will not rest until he has hunted them from this favourite haunt of theirs.

Moreover, we fully believe that this latter task, although a difficult one, would be quite as feasible as that of freeing the metropolis of mist and thick vapour. Indeed, unless Mr. Cubitt and his co-workers are fully prepared with a plan to prevent the clouds "kissing the earth" occasionally, we fear all the returns in Parliament will not avail in the prosecution of so benevolent and philanthropic an undertaking.

At the engineering works of the Midland Railway Company at Derby, Pellet's cyanofer process is worked with considerable success; we had an opportunity of witnessing the copying of tracings and drawings by the method, and the regularity and certainty with which the intense blue lines were formed upon a white ground were really surprising.

But the directors of the Midland Railway Company have yet to learn the manifold applications of photography to the work of a large engineering establishment. Instead of several assistants and printers engaged in the photographic department of the works in question, to our astonishment we found that one gentleman alone, Mr. Scotton, constituted the whole of the photographic staff.

The serious fire in Berlin, in which many valuable maps, plans, and Government records have been lost, calls to mind a suggestion made some years ago in these columns to keep duplicate copies of all valuable State documents of this kind.

The idea was to employ micro-photography for the purpose, and thus to obtain diminutive copies, which could be kept in a separate building or establishment. In this way two purposes would be served; there would be an assurance against total loss, and the limited dimensions of the copies would necessitate but small storage room.

In our own British Museum the space available for keeping books and manuscripts is rapidly filling up, and, unless there should happen to be a fire or earthquake, we shall soon be in a difficulty as to storage room. By resorting to a systematic method of copying by photography—the copies need not be microscopic, but large enough to be legible by sharp eyes or under an ordinary magnifier—one of the most troublesome problems that has plagued public librarians of late years would be solved. We may mention that, in the case of ordinary MS., twenty-five quarto pages may be reduced to the dimensions of one, and the writing be still readable by good eyes.

Mr. William Sawyer, the well-known editor of *Funny Folks*, writes:—"I was pleased with an application of photography which I saw at a party the other night. It was new to me, and may be to some readers. A gentleman, on being asked to sing, produced from his pocket a little case which contained his music, photographed down to the size of note-paper. He had duplicate copies of each song, and handed one to the accompanyist, singing from the other himself. The expedient saved all the bother of bringing a roll of music, unfolding it, collecting it again, and so forth."

We hear that Captain Abney, R.E., F.R.S., is likely to collaborate with Dr. J. M. Eder, the eminent photographic chemist and lecturer at the Vienna Technical High School, in the production of a history of photography. It would be difficult to cite two gentlemen more fitted to undertake such a task.

Colour photography again. Captain Abney has a rival, who can photograph the red end of the spectrum so that it appears upon the plate of a beautiful cherry colour. The bands and the whole region of the spectrum is of the same tint. The colour alluded to is, however, that of the black cherry.

Not a hundred miles from Hendon Street, Pimlico, may be seen the announcement, "Jem photographs." It is, however, no family boast, made to call public attention to the cleverness of brother Jem, or anyone else, but refers simply to that humble branch of the art known as gem photography.

Topics of the Day.

DEVELOPERS AND DEVELOPING.

Citric Acid in the Developer.

BY ALEXANDER COWAN.

It is a fact that will, I think, be generally acknowledged, that the next essential to a thoroughly reliable plate, is a thoroughly reliable developer. Amongst the many developing agents that have been introduced, none seem to have found such general favour as ferrous-oxalate and pyrogallic, and of these two the latter seems to be more generally preferred; but it has one disadvantage, that of quickly discolouring, and losing its developing power, when kept in aqueous solution.

Various means have been introduced from time to time to remedy this defect, and the practice of many has been to make concentrated solutions in spirit, alone or with the addition of glycerine, and dilute with water as occasion requires. These stock solutions are certainly very convenient and portable when away from home, but for studio work where large quantities are required, and constantly being used, a solution in water of the proper strength ready for use, and one that will keep for a long time without change, has many advantages.

After considerable experience with all the forms of pyrogallic mentioned, I venture to advocate the use of citric acid as follows:—

Water (distilled or common) ... 109 ounces
Citric acid ... ... 60 grains

After dissolving the citric acid in the water, add the contents of a one-ounce bottle of pyrogallic acid; this will give a solution containing about four grains to the ounce, ready at any moment to be mixed with equal proportions of any of the various modifications of ammonia and bromide that may be found to suit the development of the plates used. Of course, as some samples of plates require either a stronger or weaker solution of pyrogallic, the bulk of water may be diminished or increased, still keeping the proportion of citric acid the same, namely, about *one-eighth* the weight of the pyrogallic.

How long this solution will keep without losing its active properties I do not know, but having during the last three or four months occasionally set aside a portion from time to time, and carefully tested after keeping for three or four weeks, I have found it to develop in just the same manner as a newly-mixed solution.

In advocating the use of citric acid in conjunction with pyrogallic, I would wish to remark that I do not for a moment claim to be the first to discover its merits.

At one of the meetings of the Photographic Societies last year, Mr. Warnerke mentioned that he considered it a valuable addition in ferrous oxalate development, and casually remarked that he thought it might with advantage be used with pyrogallic; but during that gentleman's absence abroad, I could not correctly ascertain in what proportions he proposed to use it, so set about to determine by experiment the smallest quantity that would give the desired result, and I can, with confidence, recommend the formula given above.

The reasons that led me to desire a good keeping solution of pyrogallic in water in preference to those containing spirit or glycerine were these: in the solutions where glycerine is used there is always a tendency to the formation of air-bells, which, unless carefully removed, cause small transparent spots, while in those containing spirit the plates require considerably more washing to remove the greasiness before placing in the fixing bath; neither of these inconveniences will be experienced in using a developer made with water only.

In thus praising the merits of this developer, I know I ought in fairness to mention its demerits, but as, after considerable experience with it, I have failed to find any, I must leave that task to others.

Before closing this "Topic" I will venture a few remarks about the different results that may be obtained by modifications in the mode of development. I think there can be little doubt that the reason that pyrogallic seems to be so generally preferred is, that it affords such a ready means of quickly changing the character of the development, when it is found that the plate has been either over- or under-exposed, by the addition of an excess of either the accelerating or retarding agent; but there is one point that, I think, notice has not sufficiently been taken of—namely, the varied results that may be obtained by the simple means of diluting the solutions, and prolonging the time of development; and, to illustrate my meaning, I will give the record of a few experiments made with transparencies for enlargement. Four plates were exposed for exactly the same time under a vigorous printing negative. No. 1 was developed with the normal solutions in equal proportions, and the time noticed (ninety seconds) to fully bring out all the details, and give a good density. No. 2 was then placed in the dish, and flowed over with the same proportions, diluted with equal bulk of water, covered over, and allowed to develop by itself for three minutes. No. 3 was then flowed over with the same original proportions, diluted to four times the bulk, and left in the covered dish for six minutes. No. 4 was treated in the same manner, with the liquid diluted to eight times, and left for twelve minutes. The results, when examined side by side, after fixing, showed a wonderful contrast, ranging from a very deeply dense image in No. 1 to a beautiful thin transparent effect in No. 4; in fact, they show that from the same negative and with the same exposure almost any desired result may be gained by modifications in the mode of development, in addition to the power we have of altering the proportions of the solutions. During the winter months in London it is often difficult to obtain good positives for enlargement by the carbon process, but with gelatine plates and reliable artificial light they may be very easily and quickly made at any spare moment, and of a quality scarcely, if at all, inferior to carbon ones. With regard to the proportions of ammonia and bromide, I don't think anything can be definitely laid down at present, as the various plates used may each require different treatment. I have found a most convenient proportion is about one part of bromide of ammonium to eight parts of ammonia, but in practice it is very useful to have another stock solution containing equal parts of bromide and ammonia; so that in mixing solutions for use, a portion from each stock bottle may be taken to make any modification required.

The "Topic" next week will be "On a New Gas-burner," by C. Leopold Field, F.C.S.

ON IMPROVING THE SETTING PROPERTIES OF GELATINE EMULSION.

BY W. K. BURTON.

A difficulty with gelatine emulsion which must have made itself felt at one time or another, to almost all workers of this process is found in the length of time which some emulsions take to set when spread on the plates.

The time which an emulsion takes to set seems to be governed by no definite rules; emulsions made by the same formula will take quite different lengths of time to set, even at the same temperature. Probably the heat of the washing water has much to do with this.

In any case, a remedy for slow setting is to be found in the following treatment.

It is usual, after making an emulsion and washing it, to add a certain amount of alcohol after melting, often one ounce to every eight of emulsion. Do not do this, but pour the emulsion into a stone jar, and after it is quite set, pour on the surface of it alcohol to the extent of one ounce to every six ounces of emulsion, and allow to stand for three days.

Any time after this, the supernatant fluid may be poured off and the emulsion used. It will now be noticed that for every ounce of alcohol which was poured on to the emulsion, about two ounces of water, with a very little alcohol in it will be poured off.

The result of this will be that the emulsion will set, even in warm weather, in a few minutes. Sometimes, in cold weather, it will set too quickly, even before the plate can be well coated. In this case a little water may be added to bring it to a proper consistency.

The keeping of the emulsion for a few days, as recommended, will be found to improve it in every way. It will be more rapid, more dense, and more even throughout the film. I believe Captain Abney was the first to point out the advantage of keeping emulsion for a few days. I have found it still more improved by keeping for a few weeks.

It is quite possible that this method has been published before, but as, to my knowledge, it is not generally known, it will be useful at least to some.

PRINTS FROM OLD NEGATIVES.

BY THE AUTHOR OF "LOOKING BACK."

No. 13.—Priddy.

"Look here upon this picture, and on this!"

The other day I described the *last* negative of an old batch. This is really the *last*, as I find by searching the brown paper wraps, two—only two—this time; but they tell a tale. It is not an old negative. By-the-bye, when do negatives become old? I do not think there is any definite time. I should say they were old when the order was completed—when they were catalogued—when they were shelved, in fact. Thus it comes that, amongst my batch of very old negatives (carelessness on my part, I do not dispute), I come upon a pair taken at the latter end of June this year. If you remember, I was having a holiday at Cheddar then. One evening I had strolled up to the cliffs, and there, in front of the hotel door, stood that miserable-looking being, Ge-arge. Ge-arge is very peculiar; at the first glance you would take him for a lad; he is fair; he is little; his eyes are light, and his face is bald—I mean it is devoid of any attempt at hirsute appendages. But when you have studied Ge-arge, as I have done, you will find him, in more than one respect, a little "over seven."

It is a remarkable thing, but none the less true, that from sunrise to sunset, with "Cheddar volks" it is always "marning," so do not think I am making a bull when you note above that it was the evening, and now hear Ge-arge exclaim, "Marning, measter! How be?" his fingers touching his hat respectfully.

Ge-arge occasionally wakens up, thumps the table, and carries on—you know. Indeed, I once heard him sing a song—an awful song—a hideous song—a Somerset song, where the Z's were flying about like lightning out of a double-distilled thunder-storm; but, as a rule, he is solemn, and upon this occasion (there were few visitors that day) he was more so.

"How's missus, measter?" he next asks.

"Pretty well, thank you."

"Ye should take her and the young 'un for a drive; that's wot would do 'em good." And he wagged his head with the air of a "Second Daniel Come to Judgment." Here was a capital suggestion, which chimed with some thoughts that had been running in my head in the morning. But where shall we go?"

"Go to Priddy, measter!" suggested the sagacious Ge-arge. Priddy! What sort of a place was it? Oh! it was a small village, with a green, a church, and a rectory. a beautiful little place, and "there be a fair held there onct a year, measter, on the Green. Zooks, ain't there zome vrolicks! If you go, you shall see a pile o' hurdles on the Green as big as a haystack." Then, with a solemnity that impressed me greatly, he added, "I should just like you to see thic hurdles before you go, measter." Now, although I could see nothing romantic or picturesque about a haystack of hurdles, yet the manner in which Ge-arge spoke led me, at the moment, to suppose that there *would* be something wonderful about them. Besides, I pictured to myself one of those delightful, sleepy, cosy little English villages, where the mill-wheel plays *basso-profunda* to the drowsy hum of the bees; a red-tiled, white-washed, rose-bedecked, delightful little place, seething with peace and sunshine. Such was my fancy picture of Priddy. Now for the stern reality.

Behold a lovely morn! I stow my missus and the "young 'un," along with a couple of dark slides containing a couple of Wratten and Wainwright's instantaneous dry plates, and a four by five camera, into the trap, and we are ready. Bye-the-bye, Ge-arge, just before we started, suggested that we should take some provender with us, but I scouted the idea. "We will regale at the village hostelry," I exclaimed, in my most magnificent tones. I remarked that a grin overspread the wretch's countenance; I discovered the cause later on. Now off we go. There is "mine host" waving us a happy day with his white hat. Friend Cox is saluting, at the entrance of his "Open Sesame," like a serjeant on parade. Farewell! On we go, towering crags on every side. Out of a hole in an immense cliff, rushes a little man, bearded like a prad; he looks like Robinson Crusoe in reduced circumstances; he makes straight for our trap. I think of highway robbers; I look at Ge-arge on the box, and his placid and child-like countenance reassures me.

"I'm Gough!" shouts the little man, "I'm the discoverer of the great Mammoth Cave! Only one shilling—children half price! Here on the roof will be seen—men, animals, and vegetables—not green! Part of an acrostic, ladies and gentlemen." At this point he threw a mass of circulars into the trap, and departed. A sigh of relief burst from us all—even the pony snorted. And now we are slowly winding our way up the tortuous path between the cliffs. No words can convey any idea of this most magnificent defile. At one part of the pass, a crag, more than four hundred feet in height, overhangs the road; standing underneath it, one is struck with the fact that we are but pigmies after all—and very insignificant pigmies, too? The cliffs are not bare black rocks, such as you will find on the coasts of Iceland, Norway, or Scotland: they are grey, and scattered over with stunted herbage and wild flowers. I can compare these cliffs to nothing but a pass in the Lower Alps. A mile and a half of this grand scenery, and we burst upon wood and field.

We had a jolly drive, and I felt at peace with all the world. I waved a friendly hand to the joskin on the stile as he munched his cheese and bread. I smoked a culminate, and thought of friends far away. We stop ascending, and, to vary the monotony, descend.

"Here we are!" cries Ge-arge, as he waves his whip triumphantly.

"Yes, here we are!" I echo, cheerily.

"What do you think o' the scenery, measter?" he next asked.

"It's very nice—very nice indeed!" I replied. "But—but where is Priddy?"

Ge-arge fairly leapt off the box.

"Measter!" he cried, "you do astonish I! Here be Priddy! There be Priddypool—there be Priddy Round House—there be Priddy Green. Thic be the Rectory, and thic be the Church!"

As he spoke, he pointed to different parts of the compass about half a mile all round. When he came to the Rectory I held up my hand. I roared like a bull of Bashan upon him to stop. Here was a palatial building! The sunlight was glancing over the trellis work, dancing over the blossoms of the trim kept garden, lighting up the gables and the slim figures on the lawn tennis sward. Five storeys in height; cosy bedroom windows peeping at you all round the top—sycamores rearing their lofty heads—rich meadows—fertile fields! Here was an English home smiling of peace and sunshine? Here were the flesh-pots and all the good things of this earth! Holy St. George! save us from the cardinal sin of envy!

Ge-arge drew up, and, almost before you could exclaim the world-renowned name of Jack Robinson, I spread my tripod, screwed my camera, and exposed with a flash my plate.

"Oh, dad—dad! Look at the Chapel!" cried my son and heir, just as I finished.

Exhorted by my better half to observe that sacred edifice, I turned my optics in the other direction. Great sorrow! A ruin! a barn! a place unfit to keep pigs in! a disgrace! Three cornices of the tower gone—the tower itself leaning more than the one at Pisa; the ridge of the roof bent like a rainbow; the old roof itself patched up with zinc!

"What be thee about, measter?" cried Ge-arge. "Thee be'ant going to photograph that yere?"

I told him that I was—that I most decidedly should make a pair.

"Doomed, measter!" he replied, "It be'ant naething. Look at thic stack o' hurdles. Look at thic pig on the green—look at thic harse trattin'! There be summat vorth your while."

Well might I exclaim, with the great poet, "Look upon this picture, and on this?" The house of God on one hand falling to ruins; on the other, the house of his servant—but I shall say no more.

I developed with pyrogallic and bromide. The pyrogallic I mix by hand, and off-hand; I seldom make a mistake, having weighed it so many times. With this solution I cover the exposed plate (laying it in a flat dish for the purpose). One minute passes, during which time I put in my developing cup (for a half plate), five or six drops of the solution of bromide in ammonia. This, mixed with the pyrogallic, and floated on the plate, as a rule, fetches out the picture. By-the-bye, is there no dodge for expeditiously drying gelatine plates? I have tried steeping in spirits with indifferent success. One young lady I treated in this manner, and set her negative close by a gas jet. How can I picture my horror when, ten minutes after, I discovered that one corner of her mouth had run into her ear.

"This be the Inn, measter!" quoth Ge-arge, as he drew up before a cold, hungry-looking house. We alighted—the interior was worse than the exterior. We could get nothing but porter and cheese and bread; the porter was sour, and the cheese tasteless. I leant back in my chair, and crack went the back. An old fellow in a smock frock remarked that the "cheers be'ant strang," and then he assailed me with a flow of Somerset eloquence that fairly floored me.

Feeling that, after all, there was not much worth living for, I requested Ge-arge to bait his steed, and get us under weigh as soon as possible. As we passed through the Green, we saw a dilapidated policeman carrying water. This depressed me more than ever. The law lost all its dignity here.

"But what's thenk o' the hurdles, measter?"

"Hang the hurdles!"

That offended Ge-arge, and he spoke no more. I did not speak either, but, like the old woman's jackdaw, I thought all the more.

Here is "mine host" again of the Cliff Hotel.

"Well George! Have you enjoyed yourself? What do you think of Priddy?

"Of all the God-forgotten places ——!" I commenced in a violent manner.

"Hush—George—hush! Don't you lose your temper."

And I didn't.

DR. VOGEL'S EMULSION.

Our readers will be glad to read the following specification of Dr. Vogel's emulsion :—

This invention relates to the preparation, production, or manufacture of photographic emulsions. The gelatine dry plates hitherto in use are extremely sensitive, and are produced by pouring an emulsion consisting of an aqueous solution of gelatine containing bromide of silver over the plates, and allowing the same to dry.

This aqueous bromide of silver gelatine emulsion possesses the disadvantages that it decomposes very rapidly, dries very slowly when distributed over the plates, intensifies and washes with difficulty, and easily frills on the plate.

After many experiments I have succeeded in overcoming these disadvantages by an entirely new process hitherto unknown in photography, for which purpose I use gelatine containing bromide of silver (or chloride of silver and iodide of silver, or a mixture of the same), in combination with pyroxyline.

No means of combining gelatine or gelatine emulsion with a solution of pyroxyline (*i.e.*, collodion) so as to form a homogeneous fluid has been known up to the present time. If common collodion is added to ordinary gelatine emulsion the dissolved matter will be precipitated in flakes.

I have now succeeded in obtaining a perfect homogeneous mixture by using a solvent which will dissolve both substances—bromide of silver gelatine and pyroxyline. Such solvents are the various organic acids; namely, the inferior members of the fatty acids—such as formic acid, acetic acid, propionic acid, &c.—and their derivatives or mixtures of the same, alone or with methylated spirit, ethyl-alcohol, &c.

I found that gelatine bromide of silver dissolved in these solvents, without precipitating the salts of silver contained in the same, and that, contrary to all previous experience, the photographic properties of these salts were not essentially changed by the presence of the acids; that the properties of the gelatine emulsion in the solution were improved, so that it no longer possessed the disadvantages of the aqueous emulsion, as mentioned above; and that its properties are still further improved by the combination with pyroxyline.

To produce the combination aforenamed, I use the following four various methods ;—

1. I first produce a gelatine emulsion according to the customary process, which is then dried by means of cold or warm air, or other means, for extracting the water. This dry bromide-of-silver gelatine—which can also contain iodide of silver and chloride of silver—I then dissolve warm in one of the above-mentioned acids, using three to ten times as much or even more acid. The quantity of acid to be used depends on the solvency of the gelatine, and must be tried for each kind. This acidulous emulsion is now used alone, after having been diluted with alcohol to the required consistency, or can be mixed with pyroxyline. The pyroxyline is dissolved in acetic acid, a like acid, or a mixture of such acid with alcohol. The most appropriate quantity of pyroxyline is about 1 per cent. of the quantity of acidulous emulsion employed. Instead of this process the following method can be used :—

2. Pyroxyline is dissolved in one of the fatty acids—for instance, formic acid, or acetic acid, or a mixture of such acid *per se*, or with alcohol or other solvent which will dissolve both gelatine and pyroxyline. For easily soluble pyroxyline alcohol or methylated spirit, or a mixture of the same, can be used as solvent. The proportions can be varied in many different ways, so that the following formula serves simply as an example, *id est* :—

Pyroxyline	2 grammes
Acetic acid	50 „
Alcohol	50 „

The collodion produced by this process is mixed with about an equal quantity of acidulous emulsion, as above described. The gelatine emulsion collodion produced can be slightly warmed, and applied like ordinary collodion to glass plates, paper, &c., and exposed to the light either in a moist or dry condition. A similar mixture can be prepared as follows :—

3. A collodion emulsion is prepared according to the customary formula, and precipitated as usual by water; or the emulsion is allowed to dry up, then washed, and the dry matter dissolved in one of the above mentioned acids or mixtures of the same with alcohol. Gelatine, either alone or after being dissolved in one of the solvents mentioned above, is now added to the collodion preparation. The proportions can be varied in the like degree as in the preparation of the ordinary collodion emulsion. The following is, for instance, one of the various proportions of the mixture :—7 grammes of the precipitated pyroxyline containing bromide of silver are dissolved in 150 grammes alcohol and 90 grammes acetic acid ; then 2 grammes gelatine are dissolved in 20 grammes acetic acid, and added to the same. Another process for producing a similar mixture is:—

4. Dissolve gelatine and pyroxyline in one of the above-mentioned solvents, or dissolve them separately, and then mix the solutions. Finely-powdered bromide of silver prepared in the customary manner, or any one of the silver haloid salts, or a mixture of the same, is now added to the gelatine-collodion solution ; or the silver haloid salts are produced in the gelatine-collodion solution through double decomposition. These proportions can also be varied in different ways.

Having now described my said invention, and the manner of carrying the same into effect, what I claim and desire to secure by Letters Patent is :—

First.—The manufacture, preparation, or production, of a durable gelatine emulsion by dissolving gelatine, containing silver haloid salt, in one of the solvents mentioned in the foregoing specification. Second.—The mixing or the combination of gelatine emulsion and collodion, substantially as described in the foregoing specification under parts 1 and 2. Third.—The combination or the mixing of a collodion emulsion with gelatine, substantially as described in the foregoing specification under part 3. Fourth.—The preparation or production of a silver haloid-salt emulsion by distributing silver haloid salts in, or mixing such salts with, a gelatine-collodion emulsion, substantially as described in the foregoing specification under part 4. Fifth.—The application or employment of the combination of gelatine and collodion, or gelatine and pyroxyline, for the preparation of emulsions, substantially as, and for the purposes set forth, in the foregoing specification. Sixth.—The use, application, or employment of the afore-mentioned emulsions for covering surfaces for photographic purposes, such as photographic plates, papers, &c., substantially as set forth in the foregoing specification. The number of the Patent is 2162, and the date of the specification 27th November, 1880, the provisional one being lodged at the Patent Office on the 27th May last.

Correspondence.

"THE APPEAL FOR AID."

Sir,—When people are indigent, or sufficiently needy to appeal for aid to the public, 'tis usual to let us know who is going to be benefitted. 'Tis then for the photographic profession themselves to subscribe, if they think it a deserving case, and they feel that any benefit or instruction has accrued to them through the publication of the fact of the chloro-bromide of lime (I admit my iniquity and ignorance, I never heard of it or used it). As regards the giving to the profession much valuable information, &c., well, I say, what valuable information? It's so vague. I could point out many people who have given much valuable information to the profession, who never expected or ever got the slightest remuneration or "thanks" even. If a photographer has been connected with the art *so long*—from its earliest days, I mean—surely he must have been able in that long time (more than thirty years), had he been thrifty or clever, to manage to secure something to keep his head above water (perhaps it's too much above it).

N'importe, I find it is a favourite practice with some people, if even they can little afford it, to subscribe big sums, merely that their names should be in print, to show they are so "gushingly benevolent." Others there are who rail against their confrères, like the Jingos, who would go in for any amount of warfare, because they never pay a farthing towards the expense, by having income, property, and other taxes to pay. But it must be apparent to many that appeals shrouded in mystery, and whose particulars can only be obtained by first making a personal application to you, as you would hardly write to explain them, would not be met by that spontaneity of response as if it were generally known whom it was for.

I think the photographic profession are equally generous with other professions, if you take into consideration the daily applications from peregrinating operators and printers, who pleadingly affirm they've got no work to do.—I am, sir, yours respectfully, JAMES SYRUS TULLEY.

[We publish Mr. Tulley's letter because it raises several points well worth attending to. At the same time, we should remember that "the quality of mercy is not strained," and were we to bring the force of hard logic to bear upon charity, there would be little justification sometimes for its existence.—ED. P.N.]

BRISTOL EXHIBITION.

SIR,—Will you allow me to protest against the vague and absurd remarks indulged in by your critic in the issue of 31st ult., relating to a frame of prints from negatives before and after retouching, exhibited by me at the Bristol International Exhibition?

My grounds for protest are:—

1st. Such sweeping condemnation of my work might be most damaging to me (I being a professional retoucher, having for the past ten years earned my livelihood by it, combined, during the last four or five, with colouring, &c.) were I less well known.

2nd. It is so opposed to facts, which a careful examination of the pictures in question alone will prove, besides the testimony to my skill as a retoucher in my profession from the first London and provincial houses, the names of which I beg to enclose.

I am puzzled what interpretation to put upon "how not to do it." If it be that I have *overdone* the retouching, I ask, where? Is the anatomy tampered with, or is the texture of the skin marred? Never having known a similar exhibit—*i.e.*, solely in the interests of retouching—and thinking that, in consequence, it would be somewhat novel, and prove interesting to those photographers who were above the prejudices with which it—retouching—was, and, I fear, is still, assailed, I was induced to be the first by whom such a valuable (might I not say indispensable?) art should be represented in the interests of retouching and retouchers in general. This is the first time I have exhibited in photographic exhibitions, and, from the warm reception received, am inclined to say it shall be the last. However, *Ilsabio muda conscio, il nescio.*—Apologizing for taking so much space, I am, sir, yours respectfully,

W. M. CROUCH.

[Mr. Crouch's opinion of his work is evidently more favourable than that of our critic.—Ed. P. N.]

A SUGGESTION.

SIR,—I would suggest that future editions of the YEAR-BOOK be issued only in a substantial binding. In the hands of the able and energetic Editor it has become what was originally intended—a book of reference. The mass of information it contains relative to the gelatine process will make it in future a well-thumbed volume. What will then become of the paper covers? With my own copy I intend to bind also the advertisements; 'tis very convenient to have such at hand occasionally.—Yours truly,

T. G. WHAITE.

MOONLIGHT PHOTOGRAPHY.

DEAR SIR,—When publishing our moonlight photograph in its reduced form, in our Pocket Almanac, we said, "We believe this a photographic feat never before accomplished in this country," and we still maintain that belief, having regard to the brevity of the exposure, &c., fully described in the forerunning portion of our address. We think your correspondent Mr. A. L. Henderson rather misinterprets the meaning of that quoted sentence. Of course we do not imply that ours is the first or only photograph ever taken by the light of the moon, for we have seen one by Mr. Henderson, and also two or three others; but inasmuch as ours was produced in less than half-an-hour, whilst every other we have seen or heard of had very lengthened exposures, we claim for our negative results which have not hitherto been obtained.

Answering the queries in Mr. Henderson's letter: the subject of our photograph is a neighbour's house, stucco-fronted, aspect, N.E.; the lady kindly had the Venetian blinds drawn up, and the gas lighted for us in all the rooms save the attic, which was lighted by a candle; the moon at 9 p.m. had well risen, giving a clear light upon the face of the house, and strong shadows, which are well defined in the negative, owing to the short exposure given. Our object has been to show that very prolonged exposures by moonlight are not necessary upon extra sensitive bromo-gelatine plates—indeed, our experience proves them a disadvantage. We have lately secured a very pretty landscape in half-an-hour, with the cast shadows very perfect, and we have no doubt that a longer exposure would have quite spoiled the effect. If any of your readers are experimenting in this direction, we should be pleased if they would favour us with a sight of the results.—We are, dear sir, yours faithfully, D. H. CUSSONS AND CO.

HYDROGEN-GAS-TIGHT BAGS.

DEAR SIR,—At the last meeting of the Photographic Society of Great Britain, Captain Abney asked—without receiving a reply—how long hydrogen gas could be kept in a bag without escaping. As I do not know Captain Abney's address, will you kindly allow me to inform him and your readers generally, that I inflated a balloon with pure hydrogen gas on 30th December last, and that at the present moment the same balloon is before me fully inflated, without ever having had an atom of gas to replenish it during the twenty-one days. The fabric with which the balloon is constructed has not sustained the slightest injury by contact with the pure hydrogen gas. Any of your subscribers are welcome to call at my house and see the balloon at any time, for it is my intention to keep it inflated as long as it will remain in that state. It may appear rather strange, therefore, for me to be pleased that I am not in a position at present to reply to Captain Abney's question, because it is very satisfactory to me to be able to produce such a gas-tight envelope as to remain even so long as twenty-one days inflated.

I would not trouble you with so lengthy an intrusion, but from the fact that the subject of balloon photography has lately found a place in your columns.—Yours faithfully,

JOSEPH SIMMONS, C.E., Aeronaut.

68, *Kellett Road*, *Brixton*, *S.W.*

Proceedings of Societies.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE monthly meeting was held at Freemasons' Hall, 4th ult., Dr. MORTON, president, in the chair.

The principal business was to make arrangements for the Annual Lantern Entertainment fixed to take place on Jan 10th at the Burngreave Vestry Hall, kindly secured for the occasion by Mr. T. Collinson.

Accordingly, at the appointed time, in response to invitations issued by the Society, a large and appreciative audience assembled.

Dr. MORTON presided, and in the course of his opening remarks, said that of all the wonderful discoveries made in this inventive age there were perhaps few more important than that of photography. From its existence in a practical form in the year 1839, when Daguerre and Talbot brought forward their methods of taking pictures, up to the present moment, the subject had increased in value and estimation. Science and artistic work had been greatly benefited thereby, and, what was more, the public mind had been educated on the perception and appreciation of the beautiful, both in nature and art, until photography was now no longer the luxury of the few, but a necessity to the many. Reference was made to existing societies, and although the Sheffield Photographic Society was only founded in 1876, it possessed, in his opinion, the elements of vigorous growth and future distinction.

The lantern was supplied by Mr. G. V. Yates, and was managed by Mr. Hicks and Mr. F. Taylor, hon. sec. Mr. Holliday took the part of descriptive lecturer.

The views were then projected on the screen; they comprised choice bits taken at the Isle of Man, Cambridge, and local buildings, &c., contributed by Dr. Morton, Mr. Taylor, Mr. Stringfellow, and others. The scenes, with several excellent photographic portraits by Mr. Stringfellow, evoked considerable applause. The exhibition was enlivened by vocal and instrumental music. Altogether an agreeable evening was spent.

West Riding of Yorkshire Photographic Society.

The ordinary monthly meeting of this Society was held on Monday, the 6th ult., at the Market Tavern, Godwin Street, Bradford, Mr E. Passingham, president, in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Henry Mossman, Washer Lane, Halifax, was duly elected a member.

The Chairman, after a few preliminary remarks, proceeded to demonstrate the enamelling of silver prints, giving the members practical hints and advice as he proceeded with the various stages of the operation. To clean the glass, he prefers placing each in a pail of water containing a handful of soda and bringing it up to a good heat, but not to boiling point, otherwise it would break the glass. He cleans the plates with rouge, then rubs over with pounded talc, and coats with collodion, avoiding opaque. He uses the autotype, thinning down with ether and alcohol if too thick. The plate is now coated with transparent gelatine. One edge of the plate is lowered into the heated solution, with a small wire hook gradually lower the other. By a little dexterity, all air-bubbles are avoided, and a beautiful, evenly coated plate the result. By allowing the gelatine to run over the edges there would be no necessity for edging them with india-rubber. On stripping the prints he uses two-sheet cardboard. Previous to bringing them in contact with the gelatine surface of the plate, he spots out the faces with B and HHH pencils, but dress and darker parts with ivory black and india red. After thoroughly drying in a nice temperature until perfectly dry—say about six hours—the plate is laid, face downwards, on the table; a straight edge is taken, and with a sharp knife he cuts through the cardboard and film all round near the edge. The point of a knife is then run round it between the film and the glass, and, finally, the prints and mounts are trimmed with glue round the edges only.

After several questions had been answered, and a number of prints (which were all that could be desired) passed round,

A hearty vote of thanks was given to the Chairman for his demonstration.

It was then announced that Mr. J. Crosthwaite would read a paper at the meeting in February, and Mr. T. C. Bridges at the succeeding meeting in March.

After a short time spent in desultory conversation, the meeting was adjourned until the first Monday in February.

Talk in the Studio.

Photographers' Benevolent Association.—This Association will hold its annual general meeting at 8 p.m., on the 27th inst., when it is sincerely hoped the members will exert their influence to increase the strength of the Society, and thereby evince to the Board appreciation of their efforts, by placing in their power the means of bringing the Association to its proper position among the benevolent institutions of the country. The object of this Association is the establishment of a fund for the assistance of necessitous photographers, being members, who are aged, or incapacitated from earning a subsistence, and for their widows and orphans; also to assist members when in pecuniary difficulties through want of employment. All members of the profession are cordially invited to the meeting.

It is said that the Japanese were practically acquainted with the art of luminous painting nine centuries ago, thus anticipating the inventor of the supposed now phosphorescent paint. A Japanese cyclopædia cites an account of a wonderful picture of an ox which left the frame to graze during the day and returned at night. This picture came into the possession of an emperor of the Sung dynasty (A.D. 967-998), who sought an explanation, which none of his courtiers could give. At length a Buddhist priest showed that a certain nauseous substance obtained from oysters, when ground into colour material, rendered the pictures painted with the latter luminous at night and invisible through the day. The figure of the ox was painted with this phosphorescent pigment, and becoming invisible by day, the superstition arose that the animal had gone out to graze.—*Melbourne Argus.*

To Correspondents.

Albert C. Rivers.—Your view as to the function of the back combination of a portrait lens is erroneous, and your best way of satisfying yourself on this point is to copy one side of a newspaper with the combination in question.

A. Garwood.—Hardwich's Photographic Chemistry; Robert Hunt's Researches on Light; and the Manual of Photography by last mentioned author. You should also consult the back volumes of the News. Views such as you enquire about are now sold in most of the print shops of London.

F. A. Castle.—Messrs. Marion and Co., of 22, Soho Square, London, will perhaps be able to supply what you require.

C. Hazart.—We do not know of anyone who would be likely to go in for what you propose, but you might try the effect of an advertisement in the News.

Samuel Ballbrigan.—You may safely double the strength of your solution.

Good Enough.—Most of the London photographic stock houses will undertake such work; but you might find it more convenient to employ some local artificer who would work to your plans. As regards the general points to be attended to in designing a studio, you should consult the Year-Books, or back volumes of the News.

Dave.—It would be rather difficult to tell how the pictures were done, unless you were to send a specimen; but it is extremely probable that they were enamelled with collodion.

W. P.—You will very much waste your labour if you endeavour to convert your old bath into a solution suitable for sensitising albumenised paper. Why not reduce the silver to the metallic state, and make fresh nitrate?

C. Windsor.—The powder is not sufficiently fine, but you can grind it for yourself in an agate mortar.

B. J. G.—An ordinary microscope, fitted with an inch objective, will suit your purpose. Remove the eye-piece, and adapt the open tube to the front of a camera, taking care to allow for motion while making a light-tight joint. Your object is next placed on the stage of the microscope, and so adjusted that a sharp enlarged image is visible on the ground glass of the camera. As the light is feeble in such cases, a long exposure is generally required, and it is necessary to make an allowance for any difference which may exist between the chemical and visual foci of your objective. This can be done in the usual way, but, instead of the ordinary focimeter, make use of some microscopic object which possesses considerable depth, and focus some point in the central plane.

Sunbeam.—The acetate of soda merely serves to replace any free hydrochloric acid by the feebler acetic acid.

Printer.—A much better effect is produced by tinting-in at the back of the paper rather than on the face. In many cases the back may be exposed until it has acquired a deep chocolate colour.

L. C. M. One part of Coignet's gold label gelatine in six parts of water; and in dry hot weather you may add one part of glycerine to fifty parts of the solution.

Growl.—You will see that a letter appears on your side of the question.

Fairplay.—We have given insertion to a letter to Mr. Crouch, so we hope the good people at Rennes, in France, will no longer be exercised in mind on the subject of our criticism.

E. L. S.—You can hardly be surprised at the fact of your friend keeping the process to himself if he expects to turn it to a profitable account; and if he wishes for information from you on another point, you have a good opportunity of proving to him that you yourself possess a generous disposition.

L. B. Ryal.—Sulphur melts at about 115° C., and the further application of heat causes a number of curious changes to take place.

A. Banham.—Consult the formulary in the Year-Book for 1881. The principal point is to thoroughly dry the film before its application.

N. J. Holmes, and other correspondents, in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1169.—*January* 28, 1881.

CONTENTS.

PAGE
Ammonia in Emulsions ... 37
A Standard Light-Screen ... 38
Instantaneous Shutters of Various Kinds. By Leon Vidal ... 38
The Ferrotype: How it is Made. By W. Heighway ... 39
By-the-Bye ... 40
Photography In and Out of the Studio ... 41
Notes ... 41
Topics of the Day ... 42
PAGE
Reviews ... 43
Photography Outside the Studio. By Magnus Jackson ... 43
The Lime Light. By Edward Viles ... 44
The Detective Camera. By T. Bolas, F.C.S. ... 45
Correspondence ... 46
Proceedings of Societies ... 46
Talk in the Studio ... 48
To Correspondents ... 48

AMMONIA IN EMULSIONS.

Perhaps no part of photographic chemistry is so full of interest at the present time as the behaviour of ammonia with bromide of silver. The influence of ammonia in gelatine emulsions is a subject which, apparently, is not yet fully understood, if we may judge from the many opposite opinions which are continually being expressed upon it; neither could we expect the matter to be looked upon as of great importance until the theory of its action has been better explained, and the advantages of its use more generally known.

But not only is it of the first importance to those who are in the habit of preparing emulsions with ammonia that they should know exactly the reactions which may result from their operations, but to those also who prefer other methods of obtaining the requisite degree of sensitiveness it is not without interest, seeing that all emulsions are liable to become alkaline by the production of minute traces of ammonia, consequent upon a partial decomposition of gelatine, either by keeping in a cold state, or by prolonged emulsification. It is, in fact, very probable that the presence of ammonia is far more general in emulsions than is supposed; and, whether added intentionally or developed spontaneously, it cannot fail to have an important influence upon the result.

Experiments seem to show that the addition of a small quantity of ammonia to an emulsion increases the size of the grain, as well as the sensitiveness of the bromide of silver, an influence which Dr. Eder attributes to the increase of solubility of bromide of silver in ammoniacal water. A large quantity of ammonia, on the other hand, acts injuriously, both by preventing the setting of the gelatine, as well as by decomposing small quantities of the bromide. Thus, we have found that a gelatino-bromide dry plate, after an immersion of a few minutes' duration in a 50 per cent. solution of ammonia, and thoroughly drying, was capable of reduction by the developing solution *without any previous exposure to light.* This would seem to point to the conclusion that ammonia exerts a reducing action upon bromide of silver. We have since read some observations of Dr. Eder which point to a similar conclusion; he finds that a prolonged digestion with ammonia causes a partial decomposition of the bromide of silver, proportionate both to the length of digestion and the amount of ammonia contained in the emulsion; he also finds that ammonia, even in the cold, has an accelerating effect upon the production of a sensitive state.

It seems, therefore, probable that the effect of much ammonia, or too prolonged emulsification with even a little ammonia, is to cause fog, owing to the formation of minute quantities of sub-bromide by the reaction of ammonia upon bromide of silver. Possibly the liberated bromine would from, in the presence of water, hydrobromic and hypobromous acids, in accordance with the following equation:—

$$NH_3H_2O + 4AgBr = 2Ag_2Br + NH_4Br + HBrO$$

However useful, therefore, ammonia may be to increase sensitiveness, we see that it must be used cautiously, or its action may be the same as if a small quantity of the emulsion were exposed to light, and more or less fog must be the result on development. It is gratifying to know, however, that this most undesirable result is always the effect either of using too strong a solution of ammonia, or of too prolonged cooking in its presence; so that it must not be urged that this is any serious objection to its use. On the contrary, experience shows that it can in all cases be most advantageously employed with a proper amount of precaution.

That an increase of sensitiveness can be obtained, even by the use of ammonia, without any cooking at all, seems to be proved by the fact that an emulsion continually increases in sensitiveness when kept from day to day in a cold state, it becoming at the same time gradually more alkaline. It is also a fact that a slow plate may be much improved by a wash of weak ammonia solution. Neither is it probable that, if very dilute solutions be used, there is any danger of producing fog by the use of ammonia without emulsification.

Doubtless much more will be definitely known upon this subject when a greater number of English workers have overcome their scruples with regard to the use of ammonia in their emulsions. At present all that seems to be positively known of its action is—

(1). That its addition to an emulsion causes a molecular change in the bromide of silver, tending to produce an increased sensitiveness to light.

(2). That this change is produced to some extent even without subsequent emulsification.

(3). That under certain conditions, ammonia appears to be capable of reducing bromide of silver to the state of subbromide, to a certain extent at least, so as to cause fog on development of the image.

Nor must it be forgotten that ammonia is not altogether without action upon gelatine. It will be found, indeed, that gelatine is very distinctly soluble in ammonia solution, even in the cold, and the addition of much ammonia to an emulsion not only destroys to some extent its power of setting, but is likely also to encourage blisters and frilling of the film. But in this case, also, no danger is to be apprehended if sufficiently weak solutions of ammonia are employed, and if care be taken not to emulsify too long.

It is doubtless owing to want of sufficient precaution in these two particulars that so many unsatisfactory results have been attributed to the use of ammonia, and that so many have been induced to give up further trials and to adhere to the older and, in their hands, safer methods of procuring sensitiveness.

A STANDARD LIGHT-SCREEN.

Now that the gelatino-bromide process has firmly established itself as a working method, not only in the studio, but also in the hands of the out-door photographer, there is a general feeling among operators and plate makers that some standard by which sensitiveness may be measured is almost an imperative necessity.

There can be but little doubt that exposure to a standard light through a definite or standard graduated screen will afford a tolerably satisfactory measure of this quality, provided that reasonable precautions be taken as regards development and other conditions.

In the direction of a standard light, much has already been done, this matter having already occupied the attention of the first physicists of the day, and we propose to treat of the subject shortly; but the present article will be devoted to the enunciation of some points which we conceive to be essential to the construction of a definite or standard light-screen.

Up to the present time several arbitrary light-screens have been introduced for various purposes. Edwards' arrangement consisted of a graduated scale built up out of a number of thicknesses of oil silk, while Lambert preferred to make use of white or translucent paper. Quite in the same category as these stands Mr. Warnerke's sensitometer; this latter consisting of a graduated layer of pigmented gelatine, moulded by the Woodburytype process. This material possesses the advantage of not being quite so subject to change by the action of light and air as is the case with paper or oil silk. No doubt it would be practicable to make a great number of nearly identical screens, either by the method of Edwards, Lambert, or Warnerke; but to apply the term "standard" to the scales thus obtained would be a gross misnomer, as by the term standard one ordinarily means a pattern, or original, which can be copied or reproduced; as, for example, the standard yard, or the imperial pound. Then, again, it is very desirable that a standard should be capable of description in words, so that it may be capable of independent construction by workers in various parts of the world.

In the origination of the standard which we now propose, the following principles have guided us. The material forming the various steps or grades of the screen must be some body which is not only definite in its nature, but is easily obtainable in all parts of the world, and not subject to deterioration or change; while the thickness of each grade should be guaged in accordance with some recognised measure of length. The above conditions may be partially fulfilled by making use of glass cells charged with some dark-coloured solution of fixed composition, but the difficulties of preventing evaporation or other changes were sufficient to veto our finally adopting this means of carrying out our notions.

A solid body then seemed best, and of all solids which we tried, the element sulphur appears most suitable for the purpose. It is remarkably easy to cast this body in thin sheets, and when it has once attained its normal condition after fusion, it is far less subject to change than any other suitable body which we tried. As regards the numbering of the various steps, it is convenient to take the millimeter as a unit, advancing by fourths; but in ordinary cases a scale ranging from half to eight, and consequently consisting of sixteen grades, would be sufficient.

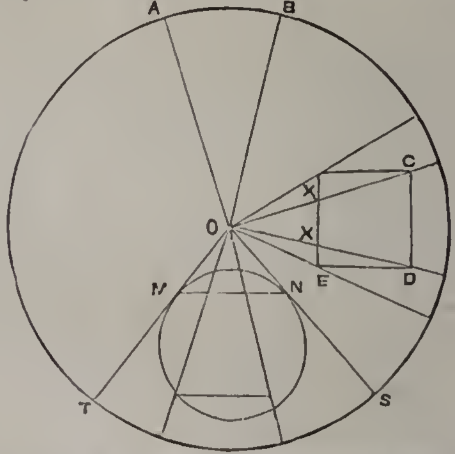
We have now said enough to enable any one to construct our standard light-screen; but after casting the pieces, a few days must be allowed for the sulphur to regain its normal condition. When a screen of greater thickness than No. 8 is required, it is convenient to cast it inside a rim or tube of brass, and to leave the rim on, so as to avoid the entry of side light.

A suitable size for the individual elements of the graduated screen is 20 millimeters square; or, in the case of circles, 20 m.m. in diameter. There should, however, be no difficulty in casting the series half to eight in a single piece. The sulphur screens may be mounted on a sheet of microscopic thin glass, bearing the requisite figures; these being either lithographed directly on the glass, or impressed by means of an india-rubber stereotype, and in either case increased opacity may be attained by dusting the image with bronze powder.

INSTANTANEOUS SHUTTERS OF VARIOUS KINDS.

BY LEON VIDAL.

"The cry is, still they come,"—although in my opinion nothing has yet been effected to meet the real want that we have to encounter. A great deal too much is said about the nature of the aperture which is best suited to an instantaneous shutter, for in practice this question is one of only secondary consideration. We are compelled, nevertheless, to give some account of the various views which are entertained. M. A. Londe, at a recent meeting of the French Photographic Society read an interesting paper on circular shutters; he has been making investigations on the most suitable form of aperture, and he finds that both square and circular openings give very defective results. To demonstrate what he considers to be the most advantageous shape of the aperture he reasons as follows:—



Suppose A B S T to be a circular disc, of which O A O B are radii, and let the disc revolve until O A comes to occupy the position previously occupied by O B. This motion of revolution having taken place in a certain space of time—one second, for instance—all the points of the straight line O A have taken that (the same) time to arrive at their corresponding positions in O B. They have moved over paths longer, and, therefore, with a velocity greater, in proportion as the points are further distant from the centre. A ray of light, therefore, entering the camera through the aperture A O B would have the same length of time to act on the lens, no matter on what point of that aperture it happened to fall. This result gives us an absolute uniformity of exposure. In the same way all apertures bounded by a couple of radii, and the arcs of concentric circles cut off by those radii, will give uniform length of exposure. But if we examine the case of a rectangular opening, let us see what the effect will be. It will be seen that the sides C D and X Y correspond to the same interval of time, since they are but chords of the arcs of concentric circles intercepted between the two radii, as in the former case. The exposure is therefore divided here into three parts; during the first, the part I Y allows the light to pass, and, when the part C D no longer allows the light to penetrate, it will still enter through X Y E. In short, if the duration of the exposure is a second for the lower part of the aperture, it will be only one-third of that time for the upper part; a circular opening has similar disadvantages. Let us draw the two radii O S and O T touching the circle ; and then M N, the chord of contact, corresponds to the longest time of exposure, as we have shown above ; but while in the rectangular aperture the maximum duration of exposure was on one side and decreased towards the other, in the case of the circle the maximum is at one part of the aperture and the exposure diminishes towards the sides. It follows from these observations that when the disc of the shutter is circular in shape, the aperture should be contained between two radii containing a greater or less angle in proportion to the angular distance. The aperture may be from 1 m. to 5 m., only the rapidity of the motion should be greater according as the radii contain a greater angle. These results are confirmed by M. Prazmonski, the able optician, who has constructed on the same principles the instruments for solar photography for the use of the Observatory at Meudon under the direction of M. Janssen. Other members of the Society present at the meeting pointed out that, as had already been stated by M. Joubert, the rectangular form is but adopted for the aperture of the falling shutter; this corroborates the views of M. Londe as regards the revolving shutter. We are, however, still waiting for a shutter which will allow the time of exposure to be measured ; but one of those shown at the meeting answered this purpose, although that exhibited by M. Baillon possessed the advantage of being quite independent of the camera, thus avoiding vibration. It is true the model which the inventor presented had rather the appearance of a catapult for projecting stones than that of a shutter, but there is no reason to criticise it too closely for its form. The principle on which it is based may be a very sound one, though the result does resemble an engine of war more than a light and simple shutter.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

II.—Apparatus and Accessories.

In purchasing apparatus it is cheapest to get the best ; success depending very greatly on the quality of the lens, and on the exact working of the camera. If the amount of money at the disposal of the ferrotyper be limited, it is better to buy one good and really serviceable instrument than two indifferent ones. It is also more economical to buy first-rate apparatus. As will be seen directly we consider the nature of the picture made, there is considerably more wear and tear to apparatus in producing a dozen ferrotypes than the same number of card pictures.

The multiplying camera is the most useful form if a large number of pictures are to be produced. By it a great saving of time is effected, and time, if the ferrotyper has any business, is his most valuable commodity. The multiplying camera is designed to expose different parts of a plate by movement of the plate-holder, so that a number of pictures may be made on a large plate, instead of wasting time in collodionizing, sensitizing, and exposing a number of small pieces. The handiest size is that where the holder accommodates a strip for four card pictures. If cameras for each size be provided, they should all be fitted throughout completely, so that waste of time in changing lenses may be avoided. Big cameras are now manufactured by which, with some easy change of lenses, nearly all sizes of ferrotypes may be made.

A glass backing, to keep the plate in place, should be provided for each holder, and a spare one always ready in case of breakage.

The plate-holders, when new, should be well saturated with oil, or rubbed over with tallow to resist the destructive action of the silver on the wood. An alcoholic solution of shellac also forms an admirable preservative for the holders. Every now and then, as occasion requires, the holder should be washed in warm water, scraped when dry, and the shellac brushed over. Tallow had best be rubbed over the holder and the groove of the camera each morning. Plate-holders cannot be too carefully used, the dark spring especially requiring gentle handling.

The cameras should be plainly marked, to guide the operator in the various movements necessary to secure the exposure of the different portions of the plate. This should be very accurately done, that the guides may be true.

The camera stand must be firm and solid, but not so heavy as to render movement about the gallery laborious.

Lenses should be of the best—each fitted to its proper camera. Constant changing is a fruitful source of failure, and is at best a needless occupation of much valuable time.

Head-rests should be light, but firm.

Copying is an important and profitable branch of every business, and a suitable stand should be provided. That I have described in my "Practical Portrait Photography" will be found very serviceable.

Apparatus should be very carefully used, or the operator will find himself in constant trouble from light-leaking and unstable cameras. A cloth should be thrown over lenses and cameras at night to preserve them from dust. The inside of the cameras should be frequently wiped out with a damp cloth.

To secure pleasing variety, it is necessary that attractive artistic backgrounds and accessories should be provided. Chairs, and small tables of various designs, a couch, ottoman, hassocks, &c., for interiors ; and a rustic gate or stile, rocks, a window, balcony, &c., for exteriors. Many of these will induce orders, customers oftentimes being struck with a sudden fancy for a particular style of picture.

Backgrounds are a consideration of very great importance, much of the beauty of a composition depending on the suitability of the background. A plain or evenly-tinted ground should be avoided.

The delicate gradation of the now well-known conical background gives force and beauty to a portrait, bringing into relief the salient points of the features without being obtrusive and unrestful.

Scenic backgounds should be of the best, the work of an artist who fully understands photography and its requirements. At least two—one for interiors, and another for out-door subjects—should be provided. In their use care must be taken that they are used only on the side of the light securing the same illumination as that represented by the painter. For standing figures, a scenic background should always be used ; and many pleasing effects may be produced by their judicious use with suitable accessories.

Backgrounds for out-door subjects should be sketchy and suggestive, and free from any sharp lines, and long unbroken lines. If any dark or light lines exist on the background, they should be kept from contact with the figure, as they are liable to merge into the lines of the figure and form an awkward combination with the subject, as well as detracting from the interest which should centre in the principal features.

Rocks, tree-stumps, imitation grass and ivy leaves, &c., are often of great use in making up a picture, and for supplying lines of composition, and lights and darks required in the picture. Although it is necessary to fill out the picture, great care is requisite that these accessories are not heaped together incongruously. The appearance of certain things evidently dragged into a composition without thought, merely to crowd the picture, is absurd. Simplicity, and above all motive, should be guiding principles to the photographer.

For interiors, several chairs of different styles should be provided, and repetition avoided as much as possible. A small table is often found extremely serviceable, and may be introduced into a composition to supply lines at the base and give an appearance of stability to the work.

A high-backed chair, for use in posing the standing figure, forms an extremely useful adjunct to the gallery, but the operator must be warned against growing too fond of this accessory and the outrageous contortions of the figure so often committed by its aid.

A curtain is one of the most valuable and artistic accessories it is possible to possess, as it may without fear of monotony be introduced so often; in so many different ways; and to serve so many purposes; and this, too, without its being obtrusive or having the appearance of a mannerism. The repp curtain falls in graceful folds, and forms lines which are of themselves, so long as they are not out of place, elements of beauty in a picture. The warning already given against allowing the lines of the background to interfere with those of the figure must be remembered in using the curtain, effects curious and unexpected, but extremely inartistic, being sometimes produced by heavy folds appearing behind the head of the figure. An iron rod about eight or nine feet high, with an arm at the top at right angles, will be found useful for holding the curtain in place.

Two dangers, which have already been alluded to, are so ever-present in the use of accessories that reiteration may be excused me: avoid overcrowding and tiresome repetition of introduction.

(*To be continued.*)

By-the-Bye.

THE STATUS OF THE PHOTOGRAPHER.

"A PHOTOGRAPHER has no status at all," we were told the other day by a gentleman, himself one of the fraternity. "Take any other profession you like," was his argument, "and you cannot name one to whom it is not an honour to belong. With photography, on the contrary, there are those on the outskirts, and ever will be, enough to drag any profession into disgrace."

This dictum, though pronounced with a good deal of prejudice and bias, deserves consideration, since it is the view, unfortunately, not of a single individual, but of a great many. Still, photographers should always remember this—that they have quite foes enough to contend against as it is, without they themselves becoming enemies to their own cause into the bargain.

It is absurd to compare photographers with the members of ordinary professions; although, if we do so, we shall at once find out a fallacy in the above argument. As an instance, let us take the legal and medical professions; law and physic, two of the oldest callings we have, are not free from the taint of unprincipled followers. There are pettifoggers and vampires in the law, and ever will be, just as there are quacks and impostors in medicine. But lawyers and doctors do not for that reason decry their race, nor lament over their profession; the presence of black sheep in a well-ordered fold is but a matter of course, and acts, indeed, as a foil to show up the purity of whiter fleeces. But in any case, it is not the insignificant and unscrupulous of any class that give it rank; the position of a community is precisely what its chief followers make it.

Leaving aside, for a moment, the question of business—and a photographer must be a man of business, like the author, the painter, the actor, nay even the poet, if he desire both wealth and fame—we shall find that a photographer's rank is governed exactly in the same way as that of every other artist; or if exception be taken to this last word, we will say in the same way as that of a writer, an actor, or a painter, whether these are artists or not. Among painters, we have the President of the Royal Academy, and the dauber of signboards; among actors, there is the leading tradgedian, and the poor super who staggers about with a banner for a shilling a night; among litterateurs are to be found "liners," and historians like Macaulay and Carlisle. Photography is but an infant calling compared with these, but we can nevertheless point to individuals who represent the Alpha and Omega of the art. As in painting, acting, and writing, so in photography, each man is for himself, and must win his own position. And this is one reason the more to be cited in favour of the claim of the cultured photographer to be considered an artist. In cricketing parlance, he makes "off his own bat" what credit redounds to him.

Thus, the status of a photographer is the position he makes for himself. Good work done will raise the photographic art, though it will not raise photographers who are incapable of good work. As we have said, photography, or rather art-photography, is still in its infancy only, but year by year, as clever recruits flock to the standard, and begin to understand and apply the capabilities of photography, we shall steadily and surely progress. There can be no doubt about this. Both in landscape and portraiture we have lately seen examples which were rare indeed in days gone by. Indeed, had it not been for the fact that men educated as painters and draughtsmen joined the ranks of photographers in the early days, the art productions of years ago would never have been seen. Rather than marvel at the disposition to dispute that there is anything of art at all in photography, we should feel surprised that so much good work has already been done in the brief period since the camera came into our hands, and the multitudinous technical difficulties have been overcome.

Every photographer, then, must work for himself, and gain a position for himself, and, as the number of artistic photographers grow apace, so estimation of photographic art will rise likewise. But, however highly photographic work may be esteemed by the public, it will always be—as in painting—the individual, and not the class, to whom honour will be given. It was not so many years ago that "painter fellows" were looked down upon; and even in the days of Thackeray, as readers of the *Newcomes* know very well, the weilding of the mahlstick was held to be a little low. Let photographers, then, take courage, for their existence is but as yesterday, compared to the worker with palette and pigments.

And now to touch upon the burning question as to whether photographers include artists in their ranks, for this matter is inseparably connected with the status of the photographer. Of course, those who fulfil merely technical duties can have no claim whatever to the title. The question is whether photographs have ever been produced entitled to be named works of fine art. Painters were very confident upon this point some years ago; they are less confident now. Granted, for a moment, no picture secured in the camera is entitled to the name. Why is it, we ask, do acknowledged artists of high standing, year after year, admire and covet the possession of this or that picture? When the president of the Society of Water Colours highly praises the pose, lighting, and delicate tones in a child's portrait; when a distinguished Royal Academician fervently longs not for one, but for a dozen examples out of a single collection; when a famous sketching club sets up the pictures of a distinguished landscape photographer as studies to be imitated; and when we have in the Royal Academy itself transcripts in colour of photographs pure and simple, we think we may fairly leave this burning question to answer for itself. There may not be any art qualities present in such photographs, only one would like to know very much what it is then that artists admire.

But the camera cannot create; it can only reflect. Be it so. There died with the old year, England's greatest living novelist, "George Eliot." She wrote of many delightful characters and described many pleasant scenes; but we find, now that she is dead, that her characters, for the most part, were not imaginary, but real; that her picturesque villages were not the conception of her brain, but green nooks and corners well-known in leafy England. They are, in short, reflections, and not creations; but George Eliot is no less an artist. Charles Dickens' characters, in like manner, were modelled from life; indeed, it has been truly said that imagination is nothing more than a lively memory.

One word, finally, on the matter of business. Because a photographer is an artist, he need not be unbusinesslike; nay, let him look ever so sharply after the question of pounds, shillings, and pence, and we can assure him he is by no means the keen man of business to be found among those whose claim to be considered artists no one disputes. The poet bargains for so much a line, ere he puts his pen to paper; the novelist will not part with his manuscript without tying the publisher down to a most minute agreement; the painter insists on guineas instead of pounds for his picture. Even men of science, on whom it has been the fashion to look as philanthropists, remind us of the proverb that a labourer is worthy of his hire, the philosopher being quite as ready to insist on good payment for his services as any merchant or tradesman can well be.

Next week the "At Home" will be "Mr. Leon Warnerke at Silverhowe, Champion Hill." The following "By-the-Bye" will be "About Medals."

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

India-Rubber Solutions in Light—Electric Light for Photography—Change of Backgrounds and Furniture—New Photographic Wide-Angle Lenses.

India-Rubber Solutions in Light.—If we are right, Mr. Swan observed about twelve years ago the action of light on india-rubber films, and not only films, but also solutions of india-rubber are sensitive to light. No precipitate is formed, only the liquid becomes thin and more fluid, while the films obtained by its evaporation are partly soluble in alcohol and ether, and, consequently, useless as a preliminary coating for plates which are to be subsequently collodionized. Dr. Eder tells us that the majority of commercial india-rubber solutions are decomposed more or less by the action of light, and are, therefore, of doubtful value for the Vogel emulsion process, where a preliminary coating of good india-rubber is required. This decomposition might, doubtless, be prevented by keeping the solution in yellow bottles. The above-mentioned decomposition of india-rubber by light is really due to oxidation. German Lager beer brewers have commenced to employ yellow bottles instead of white ones for table lager. It has been observed that in white bottles the fluid is much influenced by light, and loses its good quality.

Electric Light for Photography.—It is beyond doubt that electric light for portraiture has really succeeded in the hands of able photographers; but it must be borne in mind that the artistic effect given by the Vander Weyde arrangement is combined with a great loss of the light itself. The light does not shine directly on the sitter, the latter being only illuminated by that which is reflected from a curved screen formed of white paper. Would it be possible to avoid this loss? If so, then a much smaller Gramme or Siemens' machine, giving, perhaps, a light of three hundred candles, might be sufficient for portraiture. It is well known that red and yellow bodies lose a part of their brilliancy in electrical light, as it does not contain such a large proportion of red and yellow rays as are present in sunlight. Some large Paris houses of business fitted with electric light prefer, therefore, to employ gaslight and electric light simultaneously. It would be, perhaps, more convenient to give the electric light a reddish tint by impregnating the carbon pencils with a small quantity of strontium salt.

Change of Backgrounds and Furniture.—German photographers have introduced a new method of giving variety to their portrait pictures. It happens sometimes that a photographer uses the same background with the same chair and table for many hundred sitters, and in consequence of this, the picture possesses a certain uniformity, which is the reverse of pleasing. This can be avoided to a certain extent by an interchange of accessories among various members of the fraternity. We fear some trouble might arise from careless treatment of the lent property, but the real advantages of the system ought to more than compensate for this.

New Chemical Laboratory for Photographic Researches in Austria.—We have reported upon the new Photographic Academy in Salzberg, Austria, which has been well appreciated, there being now about twenty students. Besides this school, the Austrian Government has proposed to erect a chemical laboratory for researches bearing on the advancement of photography. The proposition will be brought before the Austrian Parliament, and £150 are asked for the purpose. The sum is a small one, but it is good as a beginning. The chief point for an institution like this is not the laboratory itself, but the manager, and as such, Austria has just the man required in the person of Dr. Eder.

New Wide-angle Lenses for Photography.—Some first-rate Continental photographers have expressed the opinion that the old portrait objective, a form of lens which is of the greatest value, will become more and more necessary in the future, provided that the sensitiveness of gelatine plates can be still more increased. We do not know whether this may be the reason why we do not hear much as regards new and improved forms of portrait lenses of late years, or, at any rate, since Dallmeyer gave us his patent portrait lens. We only remember a new construction of Voigtlander, this being but little used here, although described as being useful by various Continental photographic papers. This new lens differs from the Petzval construction as far as the back lens is concerned, the flint and crown glass not being separated by a metal ring. A long time ago Steinheil advertised a new portrait lens, but we do not hear that he has since worked it out practically. It is said that the heavy flint glass required for the new form is difficult to obtain in large discs. We have received notices of a new wide-angle lens which gives a larger field of view than the ordinary aplanatic lens of Steinheil. This new lens gives an angle of view of eighty degrees, this being sufficient for most cases. In general, it is advisable, however, to avoid the extreme wide-angle, if possible, as if the field of view is extended to ninety degrees, distortion and an exaggerated perspective set in. We have pictures at hand of the court of an arsenal, piles of cannon balls being in the foreground. It is ridiculous to see how the balls on the margin do not look like balls at all, but like eggs; and in this case the angle of view was only eighty degrees. It may be true that, according to the principle of perspective, the projection of a ball on an even surface must always be an ellipse, excepting when the cone of rays is perpendicular on the surface of projection; but no matter at all, the painter always draws a ball as a circle, whether it is situated on the margin or in the middle of the picture. And photography should do the same, if the pictures are to appear as really true.

Notes.

Photographers who employ the tungstate of soda toning bath generally experience some difficulty in recovering gold from their old solutions. Herr Fritz Haugk suggests shaking up the latter with a little commercial aniline, and then, if the liquid is allowed to stand from twelve to twenty-four hours, the gold therein will be precipitated.

Dr. Eder tells us that Vienna photographers report well of Captain Abney's plan of adding a little hyposulphite to the ferrous oxalate solution during the development of gelatine plates.

The *Practical Photographer* contains, by way of frontispiece, an excellent example of "statuary from life." It is the bust of a lady on a pedestal, to all appearance the work of the sculptor, except that the face, half turned towards you, exhibits the unmistakable warmth and vitality of life. The illusion is very perfect, no signs of printing-in being visible, while a clever trait is the contrast afforded by the rough work of the pedestal, and the fine, smooth modelling of the features.

Of course the model must be suitably dressed, posed, and lighted to make the illusion complete. In the picture before us, by Mr. Guerin, of St. Louis, the lady's hair is arranged in a Grecian coil, and the figure is draped in classic fashion so as to show the shoulders. The bust is lighted behind as well as in front, to give relief and rotundity.

The *tour de force* calls to mind another clever suggestion made by Mr. W. Woodbury some years ago. This was a plan for photographing a lady under a glass case, like a Dresden shepherdess. With an ordinary carte-de-visite lens, a narrow glass shade twenty-two inches high will suffice for the purpose. A picture of the glass case, backed with black velvet, is first secured on a plate, and subsequently a standing portrait is taken upon the same film, and within the dimensions of the glass case image. By registering, first of all, upon the focussing screen, the image of the portrait, and also of the glass, there is no difficulty in getting them to coincide. On development, the model appears to be under the glass.

The Photographic Club seems inclined for high jinks. The Committee, we see, announce a *soirée* and ball (in aid of the funds of the Photographers' Benevolent Association) for Wednesday, the 9th prox., at the City Arms Tavern, St. Mary Axe.

According to the *Deutsche Photographen Zeitung*, the hot-pressing or rolling of photographs tends materially to prevent their turning yellow.

In Paris, steps are being taken with a view to found an *école professionelle* for photographers, where photo-chemistry and technical photography will be taught. The syndicate of photographers will direct the academy, fix the standard of examination, and award diplomas. One advantage will be the possibility of obtaining properly trained photographers when they are wanted.

As important as a school of technical photography would be an art school for photographers, and we trust that ere long such an establishment may be founded in this country, at South Kensington or elsewhere. Mr. H. P. Robinson's "Pictorial Effect in Photography" is at present the only efficient guide at the disposal of the photographer; our painters and draughtsmen would not get very far without art-training, and it is absurd to suppose that photographers who desire to rank as artists can dispense with it.

For the convenience of printing-in skies, Mr. Harvey Barton, of Bristol, binds paper round the lower part of his sky-negative so as to form a sort of bag. Into this bag, or envelope—coming about half way up the negative—the landscape print is put, which is thus kept in proper position to receive the sky impression. When natural skies are wanting, an aqueous solution of gamboge applied to tissue paper is made to supply their place.

A hint in washing from Mr. Barton's establishment. The prints are not prevented from rising to the surface of the washing trough by a string net stretched across at a point below high-water mark. Thus the pictures never cake together, or, if they do, are separated again every time the water rises above them.

We quoted Miss Thackeray the other day in some lines in which she seemed a little hard on photographers; it is only fair, therefore, to show the high appreciation of the art which she has expressed in another part of her writings:—"A photograph of your friend will, to a certain point, tell you more about him in one minute than whole pages of elaborate description. You see him—himself; the identity is there; the dull worn look, or the familiar cross-grained expression; or the humorous twinkle of the eye, or the little vanities or negligences of dress, which always belonged to him."

Not only the man, says Miss Thackeray, but every little attribute and personality, are shown in his photograph. "They are all before you, summed up upon a little bit of card, which tumbles out of his letter, and which you are pretty certain to examine, even if you have not time to go on trying to decipher the words with which he accompanies his offering. There he is, more or less like, but always with a certain essence of personality, so to speak, which is produced in no other way."

The photographic portrait is certainly the "essence of personality," and, for this reason, is prized so highly among friends and acquaintances. There will always be a demand for painted canvases, particularly when a grand portrait of his Worship the Mayor is wanted for the new Town-hall, or a presentation is to be made to some M. F. H., who keeps hounds for other people to hunt; but these things are outside the sphere of photography altogether. If the little brown photograph is a humbler work of art, it is nearer and dearer to all our sympathies than the finest oil painting in the world.

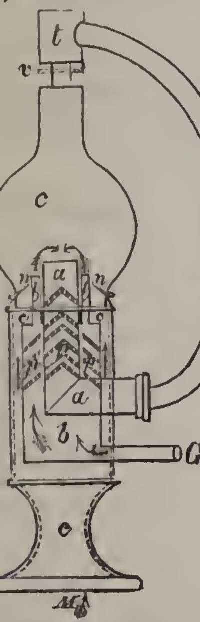
Topics of the Day.

A PERFECT GAS LAMP.

BY C. LEOPOLD FIELD, F.C.S.

Although the strides made by the electric light within the last year have been almost marked enough to justify the wild prophecy of Edison, yet the progress in street and building has been contested, inch by inch, by the improvements in gas burners, lately the subjects of countless patents. The last, and apparently most perfect of all, has been patented by a member of a family long known to fame in all branches of applied heat and electricity. Dr. C. W. Siemens has, in his reverberatory furnace, attained the acme of heat, which he measures accurately by his pyrometer. His dynamo-electric engine creates an enormous current from normal iron; which current Dr. Siemens, of Berlin, utilizes in his railway, and Dr. Siemens, of London, in his lamp, now illumining many of our stations and streets. Meanwhile, Mr. Siemens, of Dresden, has been doing battle for the gas burner, and, by applying the principle of the regenerative furnace to obtain perfect combustion, attained the maximum of luminosity compatible with coal gas burning in air.

The accompanying sketch shows roughly the principle of construction of Siemens' regenerative lamp. The body consists of three chambers, *a*, *b*, *c*. Into the internal one, *a*, a metal pipe, *P*, leads from a tube, *t*, above the glass chimney, *C*. Its top, *a'*, which is made of fine fire-clay, is surrounded by a ring of small burners, *bb*, which enter the second, or gas chamber, *b*, in direct communication with the gas supply at *G*. The walls of both chambers are of corrugated metal, and they are filled with small perforated platinum cones, *p*, *p*, *p*. The outside chamber, *c*, opens into the atmosphere at *M*, and the lip is crowned with a number of small, notched, slightly obliqued plates, *n*, *n*, which direct the air in fine jets on to the gas as it issues from the burners at *b*. The chimney, *C*, enters the top tube, *t*, by a smaller pipe closed with a throttle-valve *v*.



So much for the construction. The action is as follows. The burners are lighted in the ordinary manner. At first the flame is smoky and dim, but the heated products of combustion soon warm the tube, *t*, and, by conduction, the pipe, *P*. This induces, by convection, a current of air, moving up *P*, and drawing the hot air from *C*, down the fire-clay tube a', over the platinum cones, and through the chamber *b*. The cones and metal walls of *b* becoming rapidly hot, partly by conduction, and partly by radiation, heat the walls and cones of the gas chamber *b*, and these, in their turn, the air in *c*. The walls of *e* being of fire-clay, the heating goes no further.

The current in *p* has now grown so rapid as to suck the flame from *b* down the tube a', which grows almost white hot. The throttle valve, *v*, is then closed, and hence all the products of combustion are forced to pass through *a*. Consequently the walls and cones of *a* and *b* (in larger lamps *c* is also fitted with cones) become extremely hot, and, by of course the air and gas passing over them, equally so. Thus, when they meet at the junction of *n* and *b*, the temperature is so high that all the heat of combustion is free to act on the fire-clay tube, which it brings to a white heat, no energy being wasted in raising the temperature of the air and gas. The fire-clay tube *a'* can be raised or lowered, and the height of the flame determined by this means.

The lighting of one of these lamps is most interesting to witness. For the first few seconds the light is dim; then as the tube *p* feels the heat, the flame rises, falls over the edge of *a'*, and gradually increases in brilliancy, till, after about five minutes, tube and flame merge into one white glow, the illuminating power of which is equal to six gas flames of equal dimensions, and burning nearly four times the amount of gas. Soft and constant, this burner will doubtless supplant all others, at least in the house; and unless the electric light can be divested of its sole, but fatal, defect, uncertainty, gas in the hands of Mr. Frederick Siemens will oust its more brilliant rival, marshalled though it be by his illustrious brother, Dr. Siemens, of London.

The "Topic" next week will be, "On the Production of a Cheap and Effective Finished Enlargement," by G. Croughton.

Reviews.

Cadett's Instantaneous View Shutter.

Messrs. Marion and Co. have been good enough to forward us one of the shutters constructed upon Mr. Cadett's most recent design. Those who witnessed the action of this clever apparatus at the last Exhibition at Pall Mall are aware of the facilities it affords for exposing during certain fractions of a second—say, from one-tenth to one-hundredth. Nay, if it is desired, by a slight modification there is no reason why the exposure should not be prolonged indefinitely; only in such case, of course, the principal quality of the shutter is no longer made use of.

The most valuable feature in the shutter is the circumstance that the aperture in the revolving ebonite disc, whereby the exposure is made, is in the form of a segment of a circle; a more uniform exposure is thus ensured than would be provided by any other form of opening. An index permits one to regulate the periods of exposure with the greatest nicety, and, so far as our experiments have gone, the vibration due to the revolution of the ebonite disc does not interfere with the clearness and sharpness of the photograph.

That it is a little elaborate in its nature is only natural, by reason of the numerous offices it fulfils; and some, doubtless, who are wedded to shutters of their own, may hesitate before exchanging them for the cunning contrivance of Mr. Cadett. Those, however, who wish to be able to make very quick exposures, and have these well under control, will find the new Cadett shutter of particular value.

PHOTOGRAPHY OUTSIDE THE STUDIO.

BY MAGNUS JACKSON.*

The variety of work a photographer who devotes his time to subjects outside the studio is called on to do in the course of a season is what no one would believe, unless they saw the work performed—or, at least, had a day or two at some of the subjects, requiring very great care and attention.

I will begin by describing the tent that I have been using for the last fifteen years. It is an ordinary trunk 3 feet long, 18 inches deep, and the same in width; I have it so arranged that three small wheels can be attached; the cloth or covering is supported by four wooden rods fitting on the corners of the trunk; the inside is fitted so as to hold all that is necessary for a week's work on 12×10 plates, the divisions serving to support the bath while working. My reason for holding on so many years to the same primitive looking vehicle or tent is, that it is very convenient for getting into woods having narrow paths, and along the footpaths adjoining mansion houses in the country; it can also be put into the luggage van if going by rail, when the wheels of it fit very nicely on the back seat of the ordinary dog-cart. Having sometimes to go very long distances to photograph, I do not think that anything better could be devised when the many advantages it has are considered. There is only one fault that it has: when packed ready for a journey, the weight is something terrible: few are able to take their share of pitching it on the seat of the dog-cart. Very many most amusing stories might be told concerning my trunk containing all the appliances for work. I know that a small omnibus or cab would be very much better in many respects for going to work, and, having everything fitted up for preparing and developing the plates inside, many a picture might be secured, and, I believe, better work also; but, as I have already observed, my present form of tent has many advantages.

---

* Read before the Dundee and East of Scotland Photographic Association.

Regarding chemicals, glass plates, &c. I always make it a rule to have everything in first-rate working order, as when out at work there are plenty of difficulties to contend with, without having chemicals out of order, or having dirty glass; in fact, one requires to have everything as perfect as can be, even although it be a small bit of work that is to be done.

In regard to cleaning glass, this is one thing of great importance; nothing is more annoying, after you have got a beautiful negative, than to find that some small portion of the plate has not been sufficiently cleaned, and, on drying, or after it has stood perhaps for months varnished, to find some portions peel off. A good substratum will prevent this to a large extent, and, take it all in all, I think plates coated with a good clean substratum have the advantage over clean glass, although it is only very lately that I have used plates so treated; there is a saving of time also, and not that risk, when putting your prepared plate into the dark slide, of having it split, or when putting the negative into the plate-box, to find it all torn; but I have one word in favour of uncoated glasses when of good quality and thoroughly cleaned; beautiful clean and rich negatives were always got, provided all other details were attended to.

The development of my plates is done with a plain solution of iron and a small quantity of glacial acetic acid, and as little alcohol as possible; in fact, the less the better, as I think it is apt to make the negatives thin and poor looking. Negatives after being developed and washed are put into a zinc box with grooves, and may be kept there till there is time to do the fixing and intensifying. There is no difficulty in keeping them for months in this state. Very often a week elapses before I find time to finish my plates. Much valuable time is saved by this plan.

I now come to the second part of my paper—tree photography. Tree photography is one of the most interesting as well as one of the most healthful pursuits that any one could follow; but those who would wish to devote their energies to this department of our art must make up their minds for many disappointments. It seldom occurs, when called on to photograph trees, that you find the stillness required, and unless you have that, and at the same time light of the very best quality, it will only be waste of time and material to attempt to do them successfully. The plan I invariably adopt is to examine the subject carefully to see how I can make the best picture, at the same time to give the best representation possible of the tree; my assistant meanwhile setting trunk and other things in order. The only thing that I look after very carefully in connection with the tent is the silver bath; I am always afraid some accident will befall it. When all is ready, if light suits and not much wind, a 12 by 10 plate is prepared. While this is going on, I have another look at my subject, and have the camera ready to set up, being careful never to let my camera remain on the stand unless working it; accidents are sure to occur if left on the stand. If the wind does not blow it over, some one is certain to kick the feet of the stand, then down it comes. I have no doubt many of you know all these small matters, but, though small, they are well worth attending to, as by attention to them, many a young photographer will be saved from much loss, and at the same time get on with his work.

Trees—such as the ash, beech, elm, &c., among the deciduous trees; and deodara, hemlock, spruce, and Albertiana among the pines—require very careful watching, for on the least breath of wind the plate will be lost. I have been defeated day after day with one single specimen. But my way is to persevere till success attends me. Of course, if delayed any length of time, the light will have gone off that side which you are striving for; it must be left for another day if no other work is wanted to be done; apparatus must be packed up, and left in the charge of some one, or brought home.

One word about working in my tent. Most photographers are afraid of any white light getting into their dark-room or tent; but I have always admitted a little white light into my tent while working; it tends to prevent hardness in the shadows or darker parts of the picture. In doing trees from sixty to eighty feet high, I always use a lens capable of covering a 15 by 12 plate, so as to get good definition on a 12 by 10 plate, provided there be room to work a lens of that length of focus; if this is not done, it is impossible to get good definition over the entire plate. I generally carry with me the various combinations of lenses, and of different focal lengths, to do pictures from 15 by 12 to 10 by 8, a complete set of eight lenses with me, and a 12 by 11 camera. I have found it necessary to have that number and variety, not knowing how I might be situated when taking views, either interiors or exteriors.

The exposure of the plate on tree subjects varies according to the nature of the specimen to be done, some trees being very much darker in the foliage than others, and some having large dense masses of foliage, casting deep shadows; others, again, so thickly clothed as to present a uniform surface all over, excepting, of course, the shadowed side; but there being no dense shadows, the exposure is very much shorter.

A figure, or figures, are introduced in all pictures where practicable; but as this takes up a good deal of time, and much care and study are required in the arranging of your figures, and, unless done with artistic taste and feeling, such adjuncts had better be left out of all pictures: many good photographs are ruined by the disposing of a single figure. It is seldom one is so fortunate as to get sufficient time to expose a plate too much on this class of subject, a fit of wind coming on in nearly every case before the exposure is completed. Of course, the only way to do is to shut the lens, and wait till the leaves and delicate branches are again quiet and have fallen into their places.

I may explain why I am so careful not to expose my plates when there is any movement of the leaves, and that is, with ordinary views, where you have some stationary objects, they go a great way to make a passable picture, even although there be a little movement in the leaves; but with trees as single specimens, unless they are sharp, clear, and well defined throughout, they are worthless as works of art. I do not mean to say that it requires more care and attention than when taking an ordinary view or landscape; here as much care is required to have the different plans of the picture properly lighted as there is in any part of our business; one has to wait for hours, and sometimes days, to get a light to suit for a general view, and that when there is beautiful quiet weather that would suit near views. *(To be continued.)*

THE LIME LIGHT.

BY EDWARD VILES.*

THERE exists a wide-spread and general belief that the employment of the oxyhydrogen or lime light is a very risky and dangerous affair, and in consequence, many people are deterred from using it.

To controvert this belief; to show that all the so-called "safety-jets" are useless, because based upon erroneous notions; to point out that whatever danger exists does not lie in the use of a "mixed gas" burner, but in the manufacture of the oxygen; to elicit discussion upon disputed points; to aid, if possible, in the perfectionment of the light; and to embody the experience gained by a long-continued and successful employment of it, are the objects of the present paper.

I make use of the appellation lime light in preference to oxyhydrogen light, because the source of illumination is a piece of lime heated to whiteness. This heating is most easily effected by means of a stream of ignited oxygen and hydrogen gas forced through a blow-pipe, but, as the lighted gas possesses only very feeble illuminating powers, and as the lime would emit the light if heated by any other means, it seems simpler and better to speak of it as the lime light.

To begin, then, with the lime. This should be of the hardest possible description, and use has shown that the most convenient shape is that of a cylinder, the dimensions being about an inch and a-half in length, and three-quarters of an inch in diameter. It is supported on a pin at a little distance from the nozzle of the blow-pipe.

The burner. This should consist simply of two tubes, each furnished at one end with a suitable stop-cock. The other extremities of the tubes should be united so as to form one, and at the end should be placed a nipple, having in it a small aperture for the emission of the gas. About the diameter of this hole something will be said further on.

---

* Read before the Photographic Society of Great Britain.

From the foregoing description it will be seen that the construction of the jet is of the simplest character, namely, two tubes forming a Y shaped joint, nothing more. The main thing is, that throughout these tubes there should be absolutely nothing to impede the full and free flow of the gases, which (the necessary adjustments having been attended to) issue from the nozzle in a mixed stream.

Now, the oxyhydrogen gas burner most frequently met with in the shops differs essentially from the above, and is wrong altogether in principle and construction. It must be borne in mind that the names found on magic lanterns are simply those of the *sellers*, not of the *makers*, and these makers are controlled by the ideas of the sellers, who will have old patterns followed in spite of all reason and explanation. The actual manufacturers of magic lanterns and the necessary adjuncts are very few in number, while the *sellers* of the apparatus, styling themselves *makers*, are legion.

One great feature in the commercial jet is what is called the mixing chamber; as this is often made of brass, its exterior has an imposing look; but what service this mixing chamber performs, or what it is for, except to increase the likelihood of an explosion, and unsettle the exhibitor and audience by producing occasionally a succession of snaps like the detonation of percussion caps, I think the dealers would be puzzled to explain.

A further examination shows that the tubes are plugged up with something or other in order to check the flow of the gas. This is done from the mistaken idea that safety is gained by this means. So far from such being the case, the danger is increased on account of the enormously increased pressure which it is necessary to put upon the gas in order to force it through these obstructions. In some cases I have found the burners to be packed with fifteen or sixteen layers of fine wire gauze—sometimes with small shot, and at others the wonderful mixing chamber is filled up with a number of thin plates of brass, placed one above the other, and pierced with all manner of fantastic perforations.

Several years ago, while in conversation with one of the largest manufacturers of lime light apparatus, I asked why he followed the mischievous and useless plan of stuffing his burners with wire gauze. "It is," replied he, "because the dealers would not buy a jet of me unless it is packed with wire; although I have told them over and over again that it was a source of danger instead of safety, they will have them packed."

And now with regard to the liability to explosion. I venture to assert that it is no more dangerous to use oxyhydrogen gas in a mixed burner, than it is to have coal gas in one's house. Even now, in this decade of the nineteenth century, people exist who are afraid to use common gas. And why? The cases just run together. If coal gas is mixed in certain proportions with atmospheric air, an explosion occurs, and that this happens the newspapers frequently testify. So in the oxyhydrogen gas; under perfectly simple conditions we have our light: if the two gases are mixed improperly, we have a highly-explosive compound. But the gases can only be improperly mixed when there is most culpable carelessness or the grossest ignorance. Yet I have heard a seller of lanterns say that "nothing would persuade him to remain in a room where he knew the mixed gases were being burnt under pressure." I ought to mention that he sold burners stuffed with safety packing.

Perhaps, after all, the easiest way to form anything like a correct idea as to the precise risk of explosion, is to inquire into the practical or commercial use of the light. I am informed that at the Polytechnic, where the lime light is much employed, and necessarily looked on as an every-day matter, no explosion during combustion of the gases ever takes place.

Then there are the theatres and other similar places of public amusement. Within the last few years the lime light has been employed in them to an extent scarcely thought of by the outside public. And how often do we hear of an explosion? At large theatres it is no unusual thing—during a pantomime, for instance—for thirty or even forty lime light boxes to be alight at the same time. Those who have been gratified with a peep behind the scenes will not find it difficult to believe that if the lime light can be successfully and safely worked amid so much bustle, hurry, and confusion, there ought not to be much risk in working a lantern in a lecture hall or room.

After alluding to the preparation of oxygen, and commenting upon the inattention upon the part of some to adjust the apparatus properly, Mr. Vilos proceeded to point out the danger arising from suddenly withdrawing weights from the gas-bag.

Explosions are apt to be caused by putting on, or taking off, weights while the light is going, or while the taps are turned on. Therefore avoid the practice. I have seen the pressure changed thus in a theatre and without any accident following, but should not think of doing it myself. The explosion of a gas bag was caused in one of the central theatres in this way. The light was dim, more pressure was urgently demanded. It was Boxing-night. Nothing in the shape of a weight seemed available, until the man saw a boy. Picking him up in a moment, he seated him on the pressure-board. "Sit still, you young —— (angel), till I tell yer. If yer move yer'll be blowed inter the flies." The boy's terror was too great to hear or attend to these injunctions. He doubled up, and rolled off instanter. An explosion followed, of course: the "suck-back" of the gas consequent upon the sudden removal of pressure.

(*To be continued.*)

◆

THE DETECTIVE CAMERA.

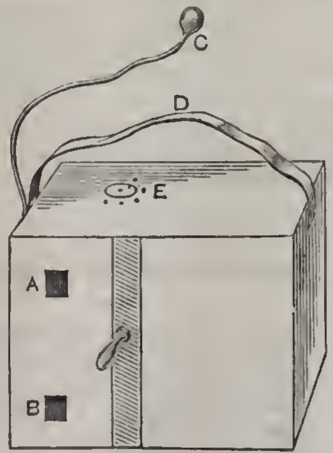
BY T. BOLAS, F.C.S.*

The following description of the apparatus in question, as recently exhibited at a meeting of the Photographic Club, may be of interest to members of this Society.

It consists of a double-bodied camera, of which each half measures about three inches by four inches inside, and this can be moved backwards or forwards by means of rackwork gearing. Each division of this double camera is fitted with a $4\frac{1}{2}$ in. focus Ross' rapid symmetrical, the image formed by one lens being received by a ground glass screen set in the immovable part of the camera, while the other image impinges on a sensitive plate contained in an ordinary dark slide. The slide and focussing screen are naturally so adjusted that both images shall be in focus at the same time, and the focussing image is viewed by a small eye-piece kept fixed in position, while a pneumatic shutter closes the aperture of the working objective.

So far the apparatus corresponds to an ordinary camera with a finder, but in order to adapt it for the class of work for which it is intended, it is entirely enclosed in a rectangular wooden box, room being left for thirteen double slides, and the only suspicious looking features about it are the small square holes corresponding to the objectives, together with the tube and ball belonging to the pneumatic shutter.

When the finder is used, it is generally quite easy to rest the apparatus against a wall, post, or some other firm object; but in many cases it is sufficient to hold the camera in the hands, especially if it be moved in the same direction as the shifting object which one wishes to delineate. In the majority of cases, however, it is altogether out of the question to use the finder, and, in such an instance, one must set the focus to certain fixed points previously determined by experiment, and recorded by the simple expedient of driving tin-tacks into the box round about the milled head. Thus, for example, when a mark on the milled head is opposite to tin-tack number one, the camera is set for a distance of twenty-five feet, or ten paces of my walking, and in this case distant objects are as sharp as it is generally desirable to have them when a figure forms the leading point of a picture.



A. Aperture for working objective. B. Aperture for finder objective. C. Pneumatic ball and tube. D. Strap for carrying. E. Focusing head.

---

* Read before the Photographic Society of Great Britain.

As in most cases the camera must be placed on the ground when a picture is taken, the apparatus should in such instances be so set down as to expose when the plate (3¼ in. by 4¼ in.) is in an upright position; thus room is allowed for a very large proportion of foreground, it being considered unadvisable to raise the lens, as no part of the apparatus can be well particularised as top or bottom.

The apparatus, as now shown, contains twenty-six plates, and measures one foot square by five in. deep, but if made by a skilful mechanic, its size would be very much reduced.

A form of the detective camera in which the finding arrangement and the stock of slides are omitted is in progress, and, indeed, just on the point of completion; also a miniature apparatus in the form of a book; and a description of these, together with some of the notions, will probably be described to the photographic public during the interval between this meeting and the ensuing one.

Some views of London street life, taken by means of the instrument, are before you.

Correspondence.

HOLMES' OZONE BLEACH.

Sir,—I have read your excellent note upon "Holmes' Ozone Bleach" in the News of the 14th, as applied to the reduction of the intensity of gelatine negatives, with much interest, but I wish to correct an error which appears to have crept in as regards its chemical composition. It is not an aqueous solution of some hypochlorite, as generally supposed, but contains hypochlorous acid largely in combination with oxygen in its nascent condition, and is essentially an oxygen bleach, quite different in its action to a hypochlorite.

Amongst its numerous applications with success is the better bleaching of esparto for paper and flax fibre for linen, also the restoration of prints and engravings withou injury to the paper or detriment to the colour of the ink which cannot be said to be the properties of any hypo-, chlorite. Nath. J. Holmes.

MOONLIGHT PHOTOGRAPHY.

Dear Sir,—I send a view that was taken by moonlight, on a dry plate of the quickest of samples that I have yet tried. It had one hour and twenty minutes' exposure, between ten and twelve o'clock on Wednesday night, the 12th ult.

The lens employed was a Darlot, which in daylight, with the same stop and a similar plate, would have required but the fraction of a second.

I am not quite satisfied as to the cause of the well-defined rings that appear around the lights from the street lamps. Perhaps you could throw more light on the subject.—I am, yours truly, A. P. Chambers.

[The picture—a row of villas with the snow on the ground—imperfect as it is, contains more detail than any we have yet seen.—Ed. P.N.].

Proceedings of Societies.

West Riding of Yorkshire Photographic Society.

The annual meeting of this Society was held at the usual place of meeting, on the evening of Monday, the 1st November last, Mr. E. Passingham in the chair. The minutes of the previous meeting having been read and confirmed,

The Secretaries presented the Annual Report, which was unanimously adopted.

The Society then proceeded to the election of officers for the ensuing session, with the following results:—

President—E. Passingham. *Vice-President*—J. Howarth.

Council—R. Broadhead, J. Garatt, E. Greaves, J. Gunstone, E. T. Jenkins, T. Ledgard, J. S. Shaw, J. Smith, and E. Wormald.

Auditor—W. E. Thompson. . . *Treasurer*—T. Illingworth

Secretaries—J. Crosthwaite and R. Holgate.

Manchester Photographic Society.

The monthly meeting of the above Society was held at the Memorial Hall, Albert Square, on Thursday, January 13th, 1881, Mr. A. Brothers, F.R.A.S., in the chair.

The minutes of the previous meeting were read and confirmed, after which the following gentlemen were (by ballot) duly elected members of the Society:—Messrs. Alfred Knott, J. K. Dalton, and J. S. Cattlow.

Mr. Thomas Heywood proposed, and Mr. Pollitt seconded, that a letter of condolence be sent to the relatives of the late M. Noton. Both gentlemen spoke of the undaunted perseverance, energy, and ability displayed by Mr. Noton in all photographic matters, and the various sciences in connection with it.

Mr. Heywood suggested that at the next meeting the Society's portfolios and albums be placed upon the table, for he believed many of the younger members knew nothing of them. He further suggested that members who had not already contributed their portraits to the Society's album should do so as soon as possible.

Mr Lytle exhibited an emulsifying can made to contain a porcelain jar and fitted with a lid which was ligbt tight, but would admit any excess of pressure to escape. He also showed some of the photographs of the Colour Photographic Company.

M. Schofield then exhibited a set of apparatus for gelatine emulsion work, consisting of an emulsifier constructed of two glass flasks, a washing apparatus made out of a teapot, a piece of canvas such as used by cheese factors, and a pourer made of glass with filter combined, constructed out of a child's feeder.

Mr. James Young exhibited a shutter for graduated exposure, and so much admired was the apparatus, that Mr. Young promised (if possible for him to spare time) to send a description and sketch for publication.

Mr. J. B. Robinson exhibited a double flat shutter (similar to one exhibited last meeting), which he had had about twenty years.

The members then retired to the lantern room, where Mr. W. J. Chadwick (the Hon. Secretary) exhibited a new triple lantern which Mr. Steward, of London, has just constructed for him. He explained the action of the dissolving taps, and the arrangements of the lenses and other matters, all of which were considered the most perfect, and during the exhibition which followed the superior quality of the lenses was admitted by many of the members.

A series of lantern slides by Mr. William England were shown on the screen, and both landscape and statuary very much admired; these were followed by an excellent series of slides by Mr. F. York, the Cathedrals of England and Wales.

Mr. W. J. Chadwick said he had a slide to show which might be interesting to many lanternists; it was the formula for calculating the size of disc to be shown by a lantern at a given distance, length of focus of lenses, &c. He remarked that although the rule was one of simple proportion, there were many lanternists who had not the happy knack to work it out.

A vote of thanks was passed to Mr. W. J. Chadwick, and the meeting adjourned until February 10th, 1881.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, on Friday, the 14th inst., Mr. Thomas Mayne, T.C. in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. George W. Casson was duly elected by ballot a member of the Society.

Mr. J. V. Robinson read a paper on "Photographic Printing, Past and Present," and advocated the search for some more permanent method of printing than the present silver process on albumenized paper.

A somewhat prolonged discussion followed on many points of Mr. Robinson's paper, showing a wide divergence of experience, and consequent conviction.

Mr. Conan indicated the outlines of a paper which he had prepared on "Instantaneous Photography," but which time did not permit to be fully gone into.

A number of beautiful views of this class of work, executed by members of the Society, were laid on the table.

The meeting then adjourned until Friday, the 11th February

Dundee and East of Scotland Photographic Association.

The fourth ordinary meeting was held in Lamb's Hotel on Tuesday evening, January 18th, when there was a large attendance of members and friends. Mr. J. C. Cox occupied the chair. A letter of apology for non-attendance was read from Lord Strathmore, his lordship being abroad.

The Hon. Secretary read the minutes of the last meeting, which were approved. The following gentlemen were unanimously elected members of the Association:—Mr. John Henderson, Rev. H. Macnamara, and Mr. Sylvester.

Mr. **Magnus Jackson** read an interesting paper entitled, "Photography Outside the Studio" (see page 43). Mr. Jackson treated more particularly of arboreal photography, in which he appears to be not only an enthusiast, but a most successful practitioner, the specimens of trees in woodland scenery which were handed round, calling forth the admiration of all present.

On the motion of the President, Mr. Jackson received a hearty vote of thanks.

Mr. **Charles Johnson**, who has been acting as Secretary since the retirement of Mr. Urie, was unanimously elected Hon. Secretary of the Association. Mr. W. D. Valentine and Mr. Jaffray were elected members of Council.

The Hon. Secretary read a letter from Mr. Maclauchlan on behalf of the Free Library Committee, granting the use of the Albert Institute for the forthcoming exhibition.

Votes of thanks were passed to Mr. J. C. Cox, President, and the Messrs. Valentine for their generous offers of presentation medals for the exhibition.

A communication from the Edinburgh Society, and reply by Secretary, were read.

It was announced that at the next meeting the President would show M. Leon Vidal's photometer, and that a lantern exhibition of slides by Messrs. Valentine, under the manipulations of Mr. H. Fraser, would be given.

The meeting was then closed.

The Photographic Exhibition at the Bristol Fine Arts Academy.

On Saturday the first International Exhibition promoted by the Bristol and West of England Amateur Photographic Association, which has been open at the Academy of Fine Arts, Queen's Road, since the 17th of December, was brought to a close by a distribution of the medals awarded to the various clases. The council and members of the Association, having taken their places at the upper end of the Landscape Gallery (the whole of the remaining space being occupied by the general public who attended in large numbers),

Colonel **Biggs** (President of the Association) distributed the medals. Previous to handing them to the recipients, he expressed his gratification in performing the pleasant duty which had devolved upon him. He might say that the Exhibition had proved a complete success, far greater, indeed, than they had anticipated. Their call was responded to in a hearty manner, and he thought the style of the pictures supplied, justified them in thinking that it was as good an exhibition as had ever taken place. He might say that the pictures came from all quarters, and he thought they deserved the praise that had been accorded to them by all parties. He would take the opportunity of thanking the committee of the Academy for the way in which they kindly assisted them and allowed them to have the rooms for the Exhibition. The affair was quite distinct from the Academy, but the committee had placed every facility in their way, and he must accord them hearty thanks for their kindness. Thanks were also due to Mr. A. H. A. Daniel, their excellent secretary, for it was due to his indefatigable zeal, discretion, and hard work, that the Exhibition had proved so complete a success. In the name of the Council of the Society he begged to tender hearty thanks to Mr. Daniel.

Colonel **Biggs** then proceed to distribute the awards, the following being a list of the recipients:—

Class 1.—The gold medal for No. 608, Augustus W. Wilson.

Class 2.—Silver medal for series 120 to 123, J. Gale; bronze medal for pictures 270 to 275, Captain W. de W. Abney.

Class 3.—Silver medal for series 32, 36, 37, 38, 39, 42, W. Harvey Barton; bronze medal for series 126 to 137, William Bedford; extra bronze medal (in this class) for great general excellence, picture 178, H. A. H. Daniel; ditto, for No. 62, School of Military Engineering.

Class 4.—Silver medal for series 607, Robert Faulkner; bronze medal for portrait (marked) in frame, 566, B. Czechowsky.

Class 5.—Silver medal for series 647, H. S. Mendelssohn bronze medal for portrait (marked) in frame, 648, J. M. Young.

Class 6.—Silver medal for picture 536, Henry P. Robinson; bronze medal for series 521 to 530, Adam Diston.

Class 7.—Silver medal for series 644 to 646, Woodburytype Company.

Class 8.—Bronze medal for series 441 to 444, Col. H. Stuart Wortley.

Class 9.—Bronze medal for No. 723, G. Hare (for his tourist camera, for excellence of design and workmanship); bronze medal for No. 712, Mr. W. W. Rouch (for portability of his tourist camera); bronze medal for picture No. 70, for instantaneous photography, George F. Williams; bronze medal for No. 80, for instantaneous photography, Hunter and Sands; a silver medal of progress, to the Platinotype Company for their improved printing process; silver medal of progress to Mr. W. B. Woodbury, for his improved method of producing Woodburytype; extra bronze medal for picture 559, George Nesbitt; extra bronze medal for picture 609, T. G. Whaite.

The President stated that they had just received a telegram from Mr. Nesbitt in which he expressed his great vexation at having missed his train.

The extraordinary severity of the weather prevented a large number of the recipients from being present; but amongst those who received the medals in person were A. W. Wilson, W. H. Barton, H. A. H. Daniel, G. F. Williams, and H. B. Berkeley (Platinotype Company)

Mr. **Wilson**, on receiving the gold medal, said that he felt exceedingly the great honour which was being done him in awarding him the only gold medal for his efforts to show what might be done in characteristic or historic photography. This he was the more sensible of when it was at what was universally admitted to be the finest photographic exhibition ever held in the Kingdom; at the same time he could not refrain from expressing thanks for the courtesy he had received from the council of the Association, coming amongst them, as he did an entire stranger.

The distribution having been concluded, the company busied themselves in having a "last look" at the galleries, the time being extended an hour beyond the usual closing hour.

Many purchases were made during the evening.

Newcastle Photographic Association.

A preliminary meeting, invited by circular, was held on Tuesday, January 25th, in the theatre of the Physical College of Science, Westgate Street, Newcastle-on-Tyne, to take into consideration if "a photographic association (such as already existed in most of large towns) might be formed."

There was a good attendance of both professional and amateur photographers.

After some general discussion, Mr. A. L. **Stevenson** was elected to the chair. He briefly stated that the object in calling the assembly together was to form a photographic society, meeting monthly, when technical discussions should take place, and experiments, improved chemicals and apparatus, phenomena and other matters of photographic interest, generally demonstrated.

Mr. H. G. **Mendelssohn** formally proposed that the society should be called "The Newcastle-on-Tyne and Northern Counties Photographic Association." This motion was seconded by Mr. **Edward Sawyer**, and carried unanimously.

The question of the amount of the subscription was next freely debated, and, on taking the sense of the meeting, by vote, those present seemed universally favourable to the charge of half-a-guinea per annum.

To further facilitate matters, a committee *pro tem*, was formed, consisting of the following gentlemen:—Professor Marrilo, Messrs. J. W. Swan, P. M. Laws, E. Sawyer, A. L. Stevenson, H. G. Mendelssohn, J. B. Payne, and W. Armstrong.

The **Chairman** next suggested the adjournment of the meeting until Feb. 8th, which was finally settled on.

Mr. J. B. **Payne**, Hon. Sec. *pro tem.*, obtained the names of about twenty-four gentlemen, then in attendance, as intending members, in addition to which he had numerous letters promising support.

After some further expressions of opinion, during which the interest evinced by the gentlemen present augured well for the future well-being of the Society, the meeting separated.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society will take place on Thursday next, February 3rd, in the Society of Arts, Adelphi, at eight p.m. The pictures of the monthly artistic competition for last year will be exhibited, and the "artists'" (judges') award made known.

City and Guilds of London Institute for the Advancement of Technical Education.—*Technological Examinations, May*, 1881.—The City and Guilds of London Institute for the Advancement of Technical Education will afford facilities for carrying out an examination in any of the subjects enumerated in the lists given below, wherever a class for instruction is formed, or a sufficient number of candidates present themselves, provided a local committee undertakes to carry out the examination according to the rules laid down in the Programme. The Committee of any Art or Science School under the Science and Art Department (a list of these Committees can be obtained upon application to the Secretary of the Science and Art Department, South Kensington, London, S.W.), or any School Board, or any "Local Examination Board" connected with the Society of Arts (a list of these Boards can be obtained upon application to the Secretary of the Society of Arts, Adelphi, London, W.C.), will be accepted as a suitable committee for superintending the Institute's Examinations. In special cases, also, the Institute may entertain propositions for the establishment of Special Local Committees for the Technological Examinations. *Subjects of Examination* :—A—(1) Alkali Manufacture; (3) Cotton Manufacture; (5) Electro-Metallurgy; (7) Flax; (9) Fuel; (11) Glass Manufacture; (13) Mechanical Engineering; (15) Mine Surveying; (17) Oils, Colours, and Varnishes, Manufacture of; (19) Paper Manufacture; (21) Plumbers' Work, Zinc, and Tin-Plate Work; (23) Silk Manufacture; (25) Sugar Manufacture; (27) Telegraphy; (29) Watch and Clock Making; (31) Wool Dyeing. B—(2) Brewing; (4) Calico Bleaching, Dyeing, and Printing; (6) Carriage Building; (8) Cloth Manufacture; (10) Gas Manufacture; (12) Silversmiths' Work; (14) Lace Manufacture; (16) Iron and Steel Manufacture; (18) Oils (Illuminating and Lubricating); (20) Ores, Mechanical Preparation of; (22) Photography; (24) Pottery and Porcelain; (26) Printing; (28) Silk Dyeing; (30) Tanning Leather; (32) Tools. Candidates may be examined in any one subject out of List A, as well as in any one subject out of List B. The Examinations will be in three Grades—I. Elementary; II. Advanced; III. Honours. Certificates (First and Second Class) will be awarded in each grade. *Prizes* :—The following Prizes will be offered in each subject: Honours—1st Prize, £5 and a Silver Medal; 2nd Prize, £5 and a Bronze Medal. Advanced—1st Prize, £3 and a Silver Medal; 2nd Prize, £3 and a Bronze Medal. Elementary—1st Prize, £2 and a Silver Medal; 2nd Prize, £2 and a Bronze Medal. The Examinations for the year 1881 will be held on the evenings of May 25th and May 26th, the Examinations in the subjects of List A on May 26th, and in those of List B on May 25th. There is no limit of age. Any persons desiring to be examined should apply not later than April 21st, to the Secretary of the nearest Local Committee, who will forward their names to the Central Office in London. No application from any candidate can be received after April 21st. Copies of the Programme, containing full particulars of the Examinations, a Syllabus of each subject, and the Examination Papers of 1880, can be obtained from the Central Office of the City and Guilds of London Institute, Gresham College, London, E.C.—(By order) Philip Magnus, *Director and Secretary*, Gresham College, London, E.C., January, 1881.

◆

To Correspondents.

Broad Arrow.—An endless band of paper is stretched over two rollers, and while these rollers revolve the whole system is lowered, so that the paper just touches the surface of a warm gelatinous mixture. It might be advantageous to first waterproof your paper by means of a weak solution of india-rubber in benzole; and it is probable that it would be advisable to make use of an emulsion containing only about half or one-third the usual proportion of water.

J. C. Burrell.—It is extremely probable that the defect is due to a reflection of light from some part of the lens mounts, or, possibly, from the edges of the lenses themselves. Sometimes sufficient light is reflected from the edge of a stop to do mischief. If you line all parts of the lens tubes with black velvet, paint the edges of the glasses, and thoroughly blacken the stops, you are not likely to be troubled in the same way again.

Opal.—You will find the ferrous oxalate to be rather more suitable than pyrogallic for the class of work in question. In the case of last-mentioned developer, the tone may be improved by long soaking in a saturated solution of alum, thorough washing, and after this treatment with the usual acetate of soda toning bath. We cannot write a complete treatise on the gelatino-bromide process in these columns. See Year-Book for 1881.

Calx.—The luminous paint, ready mixed, is sold by Ihlee and Horne, 31, Aldermanbury, E.C.; and we believe you can obtain the phosphorescent sulphide of calcium in the state of powder from Messrs. Hopkin and Williams, Cross Street, Hatton Garden.

J. D. H (London).—The conditions of lighting may be varied very much, even with the appliances which are likely to be at hand under the circumstances, and by the combustion of a little magnesium wire or white fire composition, dark parts may be lighted. We think that with the lens you mention (full aperture) an exposure of from three to eight minutes ought to suffice. You must not, however, expect to succeed the first time, as it will doubtless be necessary for you to make several experiments before obtaining a satisfactory result. It may be worth while for you to make the trial you propose with the portrait lens.

C. K. Palmer.—It consists solely of calcium carbonate.

Barium.—We have seen fairly good enlargements done under the circumstances you allude to. They are not likely to be more permanent than ordinary developed prints, but there can be no doubt as to the rapidity of the method, and the ease with which results may be obtained.

J. S. W.—The best way would be for you to commence by obtaining plates from some maker who resides near you, as you will then probably be able to arrange for a demonstration of the method of development. As regards rapidity, there is no doubt as to the superior merits of gelatine.

W. Bailey.—1. The question is one which could only be definitely settled by a series of carefully-conducted experiments. You have the two opposite opinions before you; you must either judge as to their respective merits, or you can investigate the point for yourself. 2. There is no objection whatever to keeping it in a concentrated form, but if diluted it will slowly undergo decomposition. 3. The front lens of the combination with the stop behind it will give quite as satisfactory a picture as the back lens with the stop in front, only the distortion will be of the "pin-cushion" instead of the "barrel" kind. You had better fit in a piece of velvet so as to cover the bright screw thread.

J. Commins.—The substance is not sufficiently invariable to serve the intended purpose.

Answers.—1. It is quite optional. 2. Our Publishers undertake to have photographs registered for a fee of 1s. 6d. each.

P. G. M (Winchester).—Precipitate the silver and make a fresh bath.

S. W. Talbot.—Our readers will be interested to learn that this correspondent has very successfully employed Mr. Stokee's process (Photographic News for Dec. 3rd, 1880) for the conversion of old negative baths into sensitising solution for albumenised paper. The fact of Mr. Talbot having had occasion to operate on a considerable quantity of bath rendered it well worth his while to adopt the process.

Always Ready.—You will find a lens of the rectilinear or symmetrical type, working with an aperture of about $\frac{1}{6}$, to be most suitable. If, however, greater rapidity is essential, you must use a portrait combination.

T. Lewis.—Your plan is one which you have no doubt carefully studied, and a studio made in accordance with it will no doubt prove extremely convenient. We would, however, suggest a somewhat higher pitch for the roof, in order to obviate leakage and possible damage by hail.

South Devon.—See article by Mr. Bolas in our present issue.

Enquirer.—No doubt those parts of the glass which appear to repel the emulsion are contaminated with greasy matter. Clean your plates well by means of equal parts of alcohol and ammonia made into a thin cream with tripoli.

Robertus.—No wonder that your drying-room is damp, and that "moisture constantly trickles down the zinc lining." You have made your room nearly air-tight by lining it with zinc, and there is consequently no outlet for the water formed by the combustion of the gas you so freely burn, or for that water which evaporates from your gelatino films. Insert a nine-inch pipe near the ceiling, taking care to connect to this sufficient bends to exclude all traces of light; and provide a similar inlet for cold air near the bottom of the room. Your other arrangements appear to be well planned, and likely to prove satisfactory.

Beau Nash, and several Correspondents, in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1170.—*February* 4, 1881.

CONTENTS.

	PAGE
Cold Weather and the Bath	49
Slow-Printing Gelatine Negatives	49
Photography In and Out of the Studio	50
French Correspondence. By Leon Vidal	51
The Lime Light. By Edward Viles	52
New Revolutionary Powers in Photography: Daylight Emulsification: Unlimited Heat. By Dr. Kenyon	53
Notes	53
Topics of the Day	54
Photography Outside the Studio. By Magnus Jackson	56
A Ready, Useful, and Inexpensive Lantern for Dry-Plate Work. By the "Old Hand"	57
Correspondence	57
Proceedings of Societies	58
Talk in the Studio	60
To Correspondents	60

COLD WEATHER AND THE BATH.

Under ordinary circumstances, the photographic world has more cause to complain of the disturbing influence of a high temperature on the nitrate of silver bath than of any mischief or inconvenience occasioned by winter weather. It is, indeed, a rare circumstance for the bath solution to freeze when in an ordinary developing room, which is in general use; and apart from actual solidification, the principal inconvenience resulting from a lowering of the temperature consists in a sluggishness of action on the part of the solution, and deficiency of sensitiveness as regards the plates. The recent severe weather, however, took us beyond our previous experience with respect to some points of photographic practice, and we must confess that on entering our private laboratory during the recent hard frost, we felt but little inclination to operate by the wet process, more especially as our baths were frozen almost solid: but, strangely enough, none of those bottles which contained silver solution had burst. When, however, the thaw came, we went in for a roaring fire, put the place in order, and proceeded to coat and sensitize a plate, using for the latter purpose some silver solution, which was carefully decanted from one of the "Winchesters" which we believed to contain a reliable article. When, however, our plate was removed from the bath, it presented a most attenuated and ghostly aspect; a feeble opalescence taking the place of the dense and creamy deposit of silver iodide which we expected to see. An inspection of the stock bottles containing bath solution explained the matter, it being then found that the recent changes of temperature had caused the silver solution to separate into two layers, the lower of which proved to be a strong solution of silver nitrate, while the upper portion of the liquid consisted of a much more dilute solution.

The explanation of the phenomenon is very simple. Some of the water of the bath solution froze first, and this ice, having a lower specific gravity than the bulk of the solution, naturally tended towards the surface, while a silver solution of increased strength remained in the lower part of the bottle. The ice, on melting, yielded nearly pure water, which, of course, remained floating on the heavy solution underneath, thus yielding two layers of fluid in the bottle. The bath solution which had been carefully poured off for use consisted principally of the dilute portion, while the remaining part contained the greater part of the silver. An assay showed the presence of only twenty-two grains of silver nitrate to the ounce in the decanted solution, while the remainder proved to contain fifty grains.

The above results show that it may occasionally become a matter of some considerable importance to agitate solutions which have been subjected to sufficient cold to cause partial congelation.

SLOW-PRINTING GELATINE NEGATIVES.

Printing in winter is a pursuit which tries the temper of the most patient operator. During winter, the light of London, or its surburbs, is frequently so feeble that a sheet of sensitised paper might be exposed to its influence for an hour or two without stain or detriment. This being so, it is of the first importance that negatives should be colourless in the shadows in order to obtain the full printing benefit of available light.

Not many days ago, a professional friend in distress came to us with a batch of doubtful-looking negatives; these he spread before us on a sheet of white paper—they represented his week's toil in gelatine. The negatives on their white ground looked black indeed; but here and there out of their pitchy darkness loomed a feeble light. It was a mere flicker of hope pointing printwards. By transmitted light the negatives were faultless in pose, and rich in colour, especially green and greenish-yellow about the shadows. The prevailing hue of a London mid-winter atmosphere was impressed upon them. In one or two cases the all-over stain was directly traceable to London fog.

Gelatine plates have a way of their own of photographing impure media of this sort, and of ignoring, to some degree, the main object of their use. It is well, therefore, to keep the studio clear of fog and smoke, and this may be done to a certain extent by having the apartment "fog-tight," and by a system of ventilation.

This quality, by the way, of photographing fog, renders gelatine plates all the more available for atmospheric effects out of doors. The practised eye of the operator can at once determine if there is a hazy medium in the studio by examining the sitter from a distance. If detail in the dark parts of the costume can be made out with any degree of clearness, the gelatine plate may be trusted to yield a clear negative. On the other hand, if the dark parts of the dress are veiled and indistinct, failure may be guaranteed. But this is only one phase of the slow printing quality of winter gelatine negatives.

In most of the plates submitted, the veiling was due to other causes. The plates were all of them evidently bromide plates, requiring most careful development. Moreover, they had been taxed unduly, and expected to perform impossibilities. They were undoubtedly rapid plates, under-exposed and forced in development. Now, at best, an under-exposed gelatine plate is a poor affair, and most unsatisfactory to deal with. There is nothing in it, in so far as concerns the shadows, and no known system of development can create detail where it has not been registered by the light in the camera. On the other hand, a feeble impression of shadowy detail may be coaxed out by judicious development.

Common impure water has much to account for in staining shadows. When charged with pyrogallic acid, and mixed with a large proportion of ammonia and a small proportion of restrainer, it rapidly discolours, and, as a developer, becomes inert. But, although it thus becomes exhausted, its action of staining the film goes on apace. It is, therefore, obvious that in treating an under-exposed plate with an aqueous developing solution, pure water should be employed.

Again, the quantity of developer should be always sufficient to submerge the plate. Our friend had been too sparing in this respect, and he further rocked the fluid to and fro over the film. It is well known among gelatine experts that this rocking is a mistake, and such portions of he plate as are exposed to the action of the air become rapidly discoloured. Many gelatine negatives are in this way hopelessly spoiled. The centre of the plate alone is free from stain, and prints more vigorously and rapidly than the surrounding portions of the picture.

This action of the air upon the moist film under development is most apparent in pure bromide plates. With an admixture of iodide in the emulsion, the action of air upon the exposed film is not so marked, and the development is altogether more under control.

Veiling in the shadows of bromo-gelatine negatives is frequently effected in a manner different from any already passed under review. The lamp is a factor in the question, which, strange to say, has not yet received the consideration it merits. There are still photographers, and some of them ought to know better, who cling to the old yellow or orange light. With some commercial plates it is possible to obtain good results when artificial light is filtered through two or three thicknesses of orange paper. But with pure bromide plates the case is altogether different, and multiplying the folds of orange paper has the same effect as lowering the light of the lamp until total darkness supervenes. The quantity of actinic light transmitted is alone dealt with, not the quality. It is safest, in all cases, to employ a veil of ruby glass spectroscopically tested for actinic light. A lamp fitted with a single sheet of ruby glass, covered with one thickness of orange paper to diffuse the light, affords, as a rule, a perfect safeguard against fog. The quantity of light transmitted may be increased indefinitely, provided it is of the right sort. It has been asserted that gelatine plates may be brought into actinic light during development. Our own experience goes to prove that pure bromide plates cannot be so dealt with without injury to the negative.

Even after development it is better and safer to fix the plates in non-actinic light. When this has been done, and the plates have been slightly washed, and placed in a solution of alum for several hours, no discolouration is likely to take place. On the contrary, negatives so treated possess the rapid printing quality of wet collodion plates. Of course, it is necessary, after treatment in the alum bath, to wash the negatives under the tap before rearing them up to dry.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Studios and the Weather—Photographing the Nebulæ—The Ferrotype.

Studios and the Weather.—Photographic studios must have suffered severely during the recent severe weather from the effects of frost and snow. Even the best constructed ones can scarcely have escaped, and the ingenuity of photographers must have been considerably exercised how to remove the snow without damaging the roof and breaking glass. Leakages have probably been a constant source of torment, and the annoyances arising from this cause make one hope for a time when it will be possible to have a studio which shall be absolutely weather-tight. A combination of glass and iron seems to offer the best protection; as for wooden structures, we never knew one yet that was not in a chronic state of drip, and was insatiable in regard to putty and paint. For certain work probably a large area of glass roofing will always be required, but the sensitiveness of gelatine plates warrants the supposition that the time will come when the same amount of top-light as is found in a painter's studio will amply suffice for photographic portraiture. The studio is really the photographer's *bete noir*. The studio is endless in form and variety; is is often found poked in the most awkward position possible. In the busy parts of the metropolis it is of course at the most inaccessible portion of the house; when left to the design of the ordinary builder, or to the caprice of some daring innovator who is going to revolutionise all accepted principles, it is often an unmitigated failure, and requires no end of alteration before it will work; it is a fiery furnace in the summer time, and an ice-house in the winter. When a photographer wishes to commence business, and decides upon building his own studio, he has the utmost difficulty in finding suitable premises where it can be built, and there never was, and perhaps never will be, a place where some drawback did not exist. How much more pleasant would it be if, with a process of increased sensitiveness, all this worry were rendered unnecessary. Photographic studios could then be made as comfortable as are painters' studios, expense would be avoided, and, above all, the tiresome expanse of glass roof done away with. Perhaps this halcyon time may not be so far distant as we imagine.

Photographing the Nebulæ.—The strong point of photography, it has always been contended, is its accuracy. The human eye, which is never absolutely alike in two persons, and which must be subject to variations like every other organ of the body dependent upon the health, has ever been considered inferior as a matter of the evidence of truth to the mechanical production of the camera. Much less accurate must then be the production of the work of the hand, which has to render what the eye has seen, and no amount of training can make the fingers capable of such absolutely accurate delineation as that which is performed with the greatest ease by photography. It is consequently rather curious to find a speaker at a recent meeting of the Royal Astronomical Society preferring for accuracy a drawing of astronomical phenomena rather than a photograph. The occasion which drew forth this opinion was an interesting one, being the exhibition of Dr. Henry Draper's photograph of the nebulæ in Orion, the first instance on record in which any photographic trace of the light of a nebula had been obtained. This photograph was taken on the 30th of September last, with an exposure of fifty-one minutes, and showed the brighter nucleus of the nebula sometimes referred to as the Fish's Head, and the stars in the neighbourhood of the nebula down to the nine and-a-half-inch magnitude. The difficulty of the operation was incurred by the variations in intensity in different parts of the nebula, and the images of the brighter stars were much over-exposed, and appeared as large white blotches upon the photograph, their diameter roughly corresponding with the magnitudes of the stars. In the opinion of Mr. Ranyard, who exhibited the photograph, if in the future some very much more sensitive methods of photographing were devised, it would be necessary to contrive some plan by which the brighter parts of the nebula and the light of the brighter stars should be cut off from the sensitive plate during the greater part of the exposure, so as to avoid the encroachment by irradiation of the brighter structures on to the area occupied by the fainter parts. The most noticeable feature of the present photograph, however, lay in the fact that the brightest part of the nebula as photographed did not correspond with the brightest part as given in the drawings of Bond, Herschel, Liaponnov, Lassell, Secchi, or the Earl of Ross. This difference it was that drew from a member of the Society the opinion that photography could not be relied upon for proof of change in the form of nebulæ, unless we knew the size of the instrument, the photographic process made use of, all the details of the exposure, and the method of development. Different photographic processes gave very different results from the same object; he would rather rely on accurate drawings, which gave the chief features. This dictum led to considerable discussion, in which it is satisfactory to note that the view taken by the supporter of the superiority of hand drawings did not find much favour. Indeed, when it was stated that all the hand-drawings which had been made of the nebulæ differed considerably, it was evident that no special claim for accuracy could be set up for any one of them. Whatever may be the short-comings of photography, and however processes may differ, this much is certain, that the relative actinism of the various portions of the illuminated object will be maintained. As Mr. Ranyard subsequently pointed out, although the relative brightness of various parts of an object like a corona or nebula could not be judged of from the opacity of corresponding parts of photographs, yet a photograph enabled you to tell, with great certainty, which was the brightest region of the object photographed, and afforded a very valuable permanent photometric scale, by which various degrees of brightness might be judged.

The Ferrotype.—Is the tide of favour to set in towards the ferrotype? There is certainly much to be said in its behalf, although hitherto it has been regarded as the most modest form of the art. We are inclined to think that if any artistic novelty could be introduced, which would not be costly, and produced in a form which might be given away to friends in lieu of the carte, it would be gladly taken up by the public. It is an advantage with the ferrotype that there is no waiting for results. The sitter has not time to make up his mind whether he has been flattered or the reverse. The criticism of friends—always to be dreaded by the photographer—is done away with, and there is no sending of proofs on approbation. Of course the ferrotype must be mounted in such a way as not to be confounded with "cheap and nasty" specimens; but this would be an easy matter.

FRENCH CORRESPONDENCE.

M. Christian's Method of Obtaining Positives by Artificial Light—Banquet of the Chambre Syndicale—New Experiences with the Selenium Photometer—M. O. Madden's Mode of Reducing Dense Negatives—M. Davanne's Report on Photographs and Photographic Appliances at the Universal Exhibition of 1878—Variable Solubility of Bromide of Silver in Hyposulphite of Soda of Different Degrees of Concentration, by Dr. Monckhoven—Imitation Ground Glass—Preserving India-rubber Articles.

M. Christian's Method of Obtaining Positives by Artificial Light.—It is some time ago, our readers may remember, since the announcement was made in France of a process of obtaining a positive impression without, it was said, the aid of any luminous source whatever. Although disposed, as we are, to believe in marvels and prodigies in connection with photography, this notice left us absolutely incredulous, and we remained convinced that the process in question required the action of some source of light, however feeble. This proved to be the case. M. Liebard, having become associated with M. Christian, and made acquainted with the process, has judged it easier to openly declare the mode of action, without seeking to mislead photographers by an announcement capable of giving rise to doubts, and removing from it its serious character. It resulted in our receiving a card of invitation, in which we were requested to assist in the operation of rapid and economical exposure *with or without the light of day*, taking place at the house of M. Christian, &c. To such an invitation we felt bound to respond, and on the appointed day saw the operations. We are, therefore, able to affirm that this process is worked out on an old principle, without wishing to say anything to depreciate its value and utility. Paper is coated with a film of gelatino-bromide of silver; then, when dry, it is exposed behind a negative, the time varying according to its density, but never longer than a few seconds, to a steady light issuing from three gas jets on a bracket, close approaching one another, the luminous rays of which are more directly projected upon the surface to be printed by a sort of lantern of white polished metal surrounding and enclosing the gas bracket, with the exception of the front; this is left open to allow the negative to be placed as near to the light as required. Under these conditions five or six seconds sufficed for M. Liebard to print in our presence carte-de-visite pictures. With two operating in concert, one charging the negative, and the other printing, about 300 prints may be taken off in an hour. When the printing is finished, development is carried on in a particular bath, which acts rapidly, and gives an image turning gradually to an intense black. It is then washed, fixed in hyposulphite of soda, again washed carefully, and at length toned in order to give the black print a tone more or less photographic. This toning acts indifferently during a short or long space of time. The prints are then washed in water for several hours, and are at last allowed to dry. They present a dull, matt surface, not pleasing to lovers of brilliant prints, but which is very agreeable to us, and has an artistic effect. They may be rendered brilliant in various degrees by the application of varnish or enamel. MM. Christian and Liebard do not give the formulæ of their different liquid preparations, that forming the basis upon which they conduct the business, selling their process provided 500 francs be paid at time of sale, and 100 francs per annum for five years, or 1,000 francs at once for carrying it on for five years. As to the durability of prints thus obtained, they have not yet undergone the test of time, but, experimented upon by various reagents equally with prints on albumen, we have not found them superior to the latter. We again say, with regard to these photographs, that they present nothing new, but their rapid exposure by a feeble light appears to us to be of some value.

Banquet of the Chambre Syndicale.—The Chambre Syndicale de la Photographie held its annual banquet on the 17th ult. This large and cordial assembly affords a fresh proof of the goodwill existing among the photographers of Paris. The Photographic Society of France was represented by MM. Davanne, Gauthier-Villars, and several other members. One toast, that of the *Foreign Press*, was responded to heartily, on account of photographic art in general, and the friendly international relations between photographers being kept up by such constant and useful service. This toast gave a proof of sympathy of French photographers with the foreign press.

Selenium Photometer.—We still continue to occupy ourselves with the selenium photometer of which we have already spoken. These experiments have a truly irresistible attraction; we therefore pursue them with as much interest as ardour. The variations occasioned by the irregularity of the source of electricity, and also the modification in the temperature, must be taken into account. It is known that after a certain time the resistance of the electricity-generating apparatus is considerably augmented; it is therefore necessary to arrange tables of corrections or reductions of any degree to that which existed for a resistance-determined temperature. The substance physically sensible to light existing, it is necessary to establish an accessible method to all of reading by degrees of light, and in such a manner that comparisons may be universally studied. It has appeared necessary to us to prolong our observations so long as to render us masters of the two principal notions which constitute this apparatus, both the source of electricity, and the element selenium. Certain anomalies are produced, the cause of which must be ascertained; and it is only step by step that we come to possess all the secrets of the curious workings of apparatus of this kind, likely to be so precious in photography.

M. O. Madden's Mode of Reducing Negatives.—M. O. Madden, amateur photographer, of Château-Gentier, laid before the last meeting of the Photographic Society of France, through M. Chardon, a process for reducing dense negatives. He employs a three per cent. solution of perchloride of iron, in which the plate is immersed, and may be left to reduce in intensity until the image has almost disappeared. M. Chardon has repeated this experiment seven times consecutively on one negative, and caused it to disappear, then brought it back by immersing in a bath of oxalate of iron. In the perchloride of iron the chlorine acting upon the reduced silver forms chloride of silver, which is again reduced by the oxalate of iron. This method has the effect of improving the shadows in an intentionally forced negative. It is worthy of notice.

M. Davanne's Report on Photographs, &c., at the Universal Exhibition of 1878.—The report by M. Davanne on the photographs and photographic apparatus of the Universal Exhibition has at last appeared, after a lapse of two years, proving that our national printing office takes its time; however, this important document is now in circulation, and contains a very just estimate of the state of photography at the time of our last exhibition. M. Davanne, remembering the difficulties experienced by the jury in giving unequal rewards, expresses his regret that we had not followed the example of the Vienna Exhibition, when the prizes were all of the same value. This is a very delicate question, and forms a subject which may be discussed for some time without coming to a decision. It is certain that for the jury a system based on the equality of value of the rewards, their task is considerably facilitated; on the other hand, this class method has certain merits. Despite the difficulties to be conquered, we rather prefer a method which permits of some classification, so that those who are below the limit of one of the classes may be included in a lower grade. As to finding a method of avoiding discontent, such a thing is impossible. Have you never come across the case of a certain photographer who refused the gold medal, because of a similar award to one of his competitors? The best thing to be done is to create a jury composed of competent, conscientious, and absolutely disinterested men.

Variable Solubility of Bromide of Silver in Hyposulphite of Soda of Different Degrees of Concentration.—Our excellent colleague, Dr. Monckhoven, has demonstrated a curious fact relative to the variations in the solubility of bromide of silver in hyposulphite of various strengths. In a saturated solution the bromide of silver is scarcely soluble; the most effectual strength is a 20-per cent. solution.

Imitation Ground Glass.—We find the following formula for imitating ground glass useful :—

Sandarac	18 parts
Mastic	4 ,,
Ether	200 ,,
Benzine	80 to 100 ,,

Mix and allow them to dissolve, then apply with a brush.

Preserving India-rubber Articles.—In the same journal, *Le Monde de la Science*, we find a method of preserving india-rubber articles, which harden so soon, and eventually break. The objects are soaked in a mixture of one part of ammonia and two of water. They may be left in the solution from several minutes to syme hours, or until they have recovered their former elasticity. Leon Vidal.

THE LIME LIGHT.

BY EDWARD VILES.*

Here is another valuable hint derived from every-day working. It is known that under the heat of the jet the lime sometimes splits into fragments. When this occurs there is usually a dark interval of some minutes, until, in fact, the broken lime can be removed and a fresh one fitted. When this is done a second fracture often follows, because the full heat of the flame is turned on before the lime has been properly warmed.

But this mishap need not cause more than a momentary interruption, if the pin which passes vertically into the lime be made as long as the cylinder itself, and the lime carefully sawn into two portions. One piece on the other, they should be placed on the pin, and the flame directed upon the upper half. Should a breakage happen, the fracture cannot extend beyond the division. A quick turn of the screw brings the lower half of the lime (already well warmed) up and into the required position. A second piece of lime can now be substituted for the broken piece, and all is in readiness for another fracture.

Our dealers supply to those long-suffering persons—amateurs—extra fine oxyhydrogen burners at extra fine prices. The point of recommendation is that they are fitted with platinum points. This addition was founded on the erroneous notion that because the lime is made so hot by the gas the burner is in danger of melting. Nothing of the kind happens, of course. The orifice of the jet does not become greatly heated, and platinum points are just as useless as stuffed tubes.

Few using the lime light are, I believe, aware of the extraordinary heating power of the little blue flame impinging on the lime. To place before it different pieces of metal forms an interesting experiment. A stout iron rail runs into drops like sealing wax, and is dissipated into thousands of sparks, and a bronze penny has a hole drilled through it in a moment.

With regard to the size of the hole in the jet. The nipples of brass can be readily unscrewed from the end of the tube, and they can be had pierced with holes of various sizes. My recommendation is that each person should, by actual experiment, satisfy himself as to which sized hole produces the most brilliant light. The size that would be suitable under some conditions of working would not be found suitable under others.

Sometimes the burners make a roaring or hissing sound, annoying alike to exhibitor and audience, and productive of alarm beside. The usual cause is a fragment of lime in the nipple, or a little roughness at its edge or interior surface. In the one case the remedy is obvious. In the other the inner part of the jet should be rubbed with a stout needle until made perfectly smooth. In technical phrase, the hole should be "rymered out."

In order to obtain the requisite pressure of gas, the wedge-shaped bags are placed between "pressure-boards." Formerly each bag had a separate pair of boards, and a separate set of weights. Some years ago "double pressure boards" were introduced, *i.e.*, the ordinary pressure-boards with an extra leaf. The bags, in this case, are put one on the other with a leaf of the pressure-board between them, and then one set of weights answered for the two bags.

But it was also announced that by this means the great desideratum (absolute equality of pressure) was obtained. At first sight this looks likely, but it is susceptible of proof that the pressure is not only continually varying as the angle of the pressure-boards becomes more acute, but that nothing like equality of pressure is ever obtained.

I will transcribe, from memoranda made in 1875, a brief account of the experiments instituted to settle this question.

To arrive at the amount of pressure I made a simple gas gauge, which can be constructed by any one with little expense and trouble. A piece of glass tube about $\frac{3}{8}$ of an inch in diameter and 13 inches long was bent in the middle into the form of the letter U. In between the uprights a scale, divided into inches and tenths, was fixed, and then water was introduced until the syphon gauge was half full; this forms a simple and effective means of testing the pressure of gas up to six inches.

The hydrogen bag, of white mackintosh, measuring 2 feet $6\frac{1}{2}$ inches by 3 feet $6\frac{1}{2}$ inches by 24 inches wedge, was filled from the main until highly distended, and then placed between the lower boards. The oxygen bag, of brown mackintosh, of a more pliable nature than the white, was, when nearly full, put between the upper boards, and four 28 lb. weights placed on the top in the usual way.

I should mention that the taps inserted in the two bags were just the same in size, and free from all obstructions.

By means of the usual flexible tubing a connection was made between the hydrogen bag and the pressure gauge. The gas was then turned on. Its force was such as to drive the water out of the opposite leg of the syphon, so that the pressure was plus six inches—I don't know how much.

The connection was now made in the same way with the oxygen bag, and the tap turned on as before. The water rising gently showed to be only $2\frac{1}{10}$ inches.

This extraordinary discrepancy amazed me.

Next the bags were reversed—the oxygen undermost, the hydrogen above. The pressure was tested as before.

Result—Hydrogen	$5\frac{3}{10}$ inches
Oxygen	$2\frac{6}{10}$,,

---

* Continued from page 45.

Restoring the bags to their original position, where the difference of pressure was so great, I connected the taps with the lantern burner. The light was steady, brilliant, and in every way satisfactory. I left it burning for some time, and tried to account for the astonishing result.

Next I expelled the gas from the bags until they were both the same height in wedge; the middle board being just 21 inches distant from the bottom one, and 21 inches from the top. Surely, thought I, if ever the pressure is equal, now must be the time, so I lifted on the weights, and proceeded as before.

Result—Hydrogen bag undermost, pressure $2\frac{7}{10}$ inches
Oxygen bag uppermost ... ... $3\frac{4}{10}$ „

Reversing the bag, the gauge showed:—

Hydrogen uppermost, pressure ... 4 inches
Oxygen undermost ... ... $2\frac{2}{10}$ „

Having at hand an oxygen bag partly filled, the dimensions of which were somewhat smaller, I substituted it for the other, with the following result:—

Hydrogen undermost, pressure ... $3\frac{1}{10}$ inches
Oxygen uppermost... ... ... $3\frac{1}{2}$ „

But when made to change places—

Hydrogen uppermost, pressure ... $2\frac{1}{2}$ inches
Oxygen undermost ... ... $4\frac{2}{10}$ „

From the above it seems certain that equal pressure of gas is not necessary. Nor is it obtained by using double pressure boards.

It is important to mention that, when the light was burning, the bag taps were turned on to the full; but the taps at the burner were only partly turned on. It is here that the pressure is regulated, and, while the light retains its brilliancy, no explosion can happen.

India-rubber bags, however, can be set down as necessary evils. In my own case, I have long since dispensed with the use of them. Outside the studio are two iron gas holders, miniatures of the ordinary gasometer. These contain each about 30 cubic feet of gas. They are filled up from time to time, and the lime light is always ready for use; for when thus stored the oxygen gas keeps perfectly for an indefinite time. In india-rubber bags, however, if gas is kept, a double destruction goes on—the bag perishes, the gas deteriorates. After a while atmospheric air finds its way through the mackintosh, and then an explosive compound is formed. Therefore, at the close of each exhibition, india-rubber bags should always be thoroughly emptied.

◆

NEW REVOLUTIONARY POWERS IN PHOTOGRAPHY —DAYLIGHT EMULSIFICATION—UNLIMITED HEAT.

BY DR. KENYON.[*]

If there be one thing which has been more insisted upon than another, it is the necessity for the most absolute exclusion of white light during the preparation of gelatino-bromide emulsion. If there has been one thing only less stringently insisted upon, it has been the regulation of the temperature at which the emulsion is prepared.

The recent careful essays by Mr. W. B. Bolton and Dr. Eder show clearly that it is the setting in of fog which limits or impedes the attainment of sensitiveness, and which is the great element of uncertainty in the preparation of every sensitive emulsion. To meet the first requirement we have to submit to the miseries of working in the darkness of ruby light. To meet the second requirement we have all sorts of complications of lamps and hot-water pans, tins, flasks, and cracked bottles.

In the plates I exhibit there will be discerned no vestige of light, fog, or chemical fog, or any other evil; yet the cooking of the emulsion with which these plates were prepared was effected (with a small proportion of the gelatine) by boiling over the full flame of a Bunsen burner. The vessel containing the emulsion was only separated from the flame by a piece of tin and a quarter of an inch of sand—that is, a sand bath was used instead of a water bath, and the heating was continued for two hours. The thin emulsion was thus most effectually boiled. Moreover—and to this also I wish to draw your special attention—the whole mixing and preparation of the emulsion prior to the washing was conducted in the ordinary light of day. The only difference from what is used in the process employed was the mixing of double the amount of water in the emulsion, to allow for loss by evaporation, and the addition of ten grains of bichromate of potash to each ounce of the water employed first in the subsequent washing by Wratten and Wainwright's method, allowing the minute threads of emulsion to soak for one hour in the bichromate solution.

To Captain Abney we are indebted for the knowledge that by this means both light fog and chemical fog are eliminated. Captain Abney has recommended the use of bichromate where fog is *accidentally* incurred. By the time this is discovered, the remedy will be too late commonly to be of much use, considering that its then application involves *fresh* manipulations, washings, and dryings.

My claim is to have discovered that the efficacy of bichromate is such that daylight and comparatively unlimited heat may be deliberately and advantageously employed in the preparation of the emulsion; and I make bold to recommend its introduction as a part of the regular every-day procedure, whereby we may have the comfort of working in ordinary light, and in a room warmed and ventilated with an open fire, at the same time that we can easily see what is going on, and, amongst other things, use test paper *ad libitum.*

Here I may observe, in passing, that on this occasion the emulsion, nearly neutral at first, increased in acidity during boiling instead of becoming alkaline, as we are told it is wont to do. The gelatine used was Nelson's No. 1. With plates so rapid it is, perhaps, necessary to add bromide to the ferrous oxalate developer. The plates prepared in the foregoing manner proved to be extremely rapid. They developed in the most clean and brilliant manner with bromide in the developer, and differed in no way from the rest of their kind in this respect. As a first attempt, the emulsion in preparation was not exposed to the light more than needful. The mixing and boiling was done in an opaque "Devonshire cream jar" lightly covered with a cork; but no special pains were taken to avoid access of light.

It would, I doubt not, be quite practicable to coat the plates in white light, leaving the washing with bichromate until the last; but this would be more troublesome, and therefore not advisable. I propose to make further experiments, admitting the fullest extent of light and boiling over the naked flame in a thin flask.

The addition of the bichromate to the first washing water serves most effectually to harden the water, and the subsequent washing was rapid and easy in the extreme. Probably less bichromate or a shorter soaking would have sufficed. A minute quantity of chrome alum was added to the emulsion prior to coating, and although nothing but soft water (very cold) was used, there is no sign of frilling.

In conclusion, I feel confident that this procedure will be generally adopted, and will lead to an immense increase in the facility and certainty—especially on the large scale—with which gelatino-bromide emulsion will be prepared. There is at once and for ever an end put to all elaborate and tedious precautions in conducting the heating process, so far as danger of fog is concerned. The means by which this is effected involve no additional manipulations, but are simple and completely effective.

---

[*] Read before the Liverpool Amateur Photographic Association.

◆

Notes.

Dr. Kenyon's paper on the preparation of gelatine emulsion in daylight, which we print elsewhere, will be read with considerable interest by all. If, as there seems no reason to doubt, Dr. Kenyon can produce a highly sensitive emulsion without paying particular attention to the temperature at which it is cooked, and can moreover perform most of the operations in "the ordinary light of day," he will indeed have conferred a blessing on photographers.

Mr. J. Thomson has been engaged during the past week in taking pictures in the fog. The delicate veiling of the fog in some of the landscapes is quite artistic, the various gradations of haze being exhibited with exquisite effect.

We looked in upon the Luxograph Company in the Strand one evening last week, and, despite the arctic weather, we found the establishment in full working order. The exposures made were certainly very rapid, from four to five seconds sufficing for a carte portrait. Nor was the blue glare of light painful to the eye. We had the pleasure of sitting, the head, of course being turned from the reflector; and beyond, perhaps, a little surprise, felt no inconvenience from the sudden flare up that produces the light.

It seems to be the fashion, now-a-days, when a ball in fancy dress is given, to have a photographer stationed in the back drawing room, for the purpose of depicting the bizarre costumes and their wearers. Mr. Tuohy, of Richmond, appears, from his experiments, to be attempting something more; he endeavours to secure pictures in the ball-room itself.

A correspondent writes from the Thuringian Forest:—"During the heavy snow which has clothed the whole of mid-Germany in a robe of white, I have been busy attempting to photograph the Wartburg. The temperature was —10° Reaumur, and the wet process would therefore have been out of the question. The old grey fortress, on its pedestal of white, stands out sharp and clear in the frosty atmosphere, and makes a better picture, I think, than in summer, when the towers are seen rising out of a sea of waving foliage."

The old castle of the Wartburg, beyond its romantic site, is one of the monuments of ancient Germany, and therefore well deserves the attention of landscape photographers. It is the cradle of the Landgraves of Thuringia, the scene of the miracles of the Holy Elizabeth, and, above all, the spot where Martin Luther translated the Bible. We remember, when we visited the Lutheran apartments, some years ago, being shown a patch on one of the walls, said to be the remains of an ink-stain, due to Luther having once thrown the inkstand at the devil, when the latter tried to tempt him from his work.

A correspondent suggests a practical plan of testing instantaneous shutters. Let each maker be provided with his own apparatus at a pigeon match, cameras being employed instead of guns; the highest number of birds secured in the end would then denote the winner, and, as our correspondent points out, the sport would be far less cruel than an ordinary pigeon tournament.

If photography count many humble disciples in its ranks, it must not be forgotten that the Upper Ten as well as the Lower Ten are represented. It is already known that both the Duke of Edinburgh and Prince Leopold are well versed in photographic manipulations, as as also are the King of Portugal and the Emperor of Brazil. We now hear that among other distinguished photographers may be counted the Austrian Crown Prince and the Bey of Tunis. The last is a most accomplished landscape photographer.

The statue of Nicéphore Niépce, to be erected at his birthplace, Chalôns-sur-Saone, has at length been taken in hand by M. Guillaume, of Paris. It is to be of white marble, and will be finished by May next, when the ceremony of unveiling will take place.

Most of us know all about the heliograph, and how sunshine signals are flashed from one military post to another by moving a mirror properly adjusted to reflect rays in the desired direction; but few have heard the story of how the Ekowe garrison managed to communicate with Lord Chelmsford on the Tugela, when the former was invested by the Zulus, for there was no heliograph at Ekowe, it must be remembered. Major Macgregor, of the 29th, now supplies us with the information. A shaving glass, covered now and again with the skirt of one's coat, was at first called into requisition, but afterwards a toilet looking-glass, fortunately in the possession of one of the officer's servants, was made to do duty as a signalling mirror.

Since glass negatives break, and paper prints discolour, what is the best plan of preserving portraits and pictures of value? A friend, remarking upon the perfection of Daguerre's portrait in our Year-Book, suggests that Daguerreotypes should be taken where the result is likely to be of permanent value, for the metal plate is the most durable form of photograph, and permits of perfect copying any time impressions may be desired.

If the fact of roasting an ox on the Thames during the severe frost of 1814 has not been questioned, the locality of the event furnished, during the past few weeks, much subject for comment. So that there might be no question raised hereafter about the roasting of a sheep at Twickenham the other day, a photograph was taken of the scene, to record the interesting ceremony.

Topics of the Day.

ON THE PRODUCTION OF A CHEAP AND EFFECTIVE FINISHED ENLARGEMENT.

BY G. CROUGHTON.

A finished enlargement, which shall be cheap and *not* nasty, is greatly to be desired.

My object in writing this paper is to give plain and practical instruction for the production of cheap and effective enlargements which shall successfully rival the productions sent out by those firms who have pushed the club mania to an excess, and I write from practical experience, having had much to do with this class of picture.

First for the enlargements. My enlarging apparatus is in the dark room; it has more than once been described in the pages of the News, so that I will not take up space here by describing it again. Get one dozen 12 by 10 flatted crown glasses. I use Houghton's ○ marked, for then I am always sure of the right side, and keep them always for this one purpose. They must first be soaked in strong soda solution for one night, then passed into an acid solution (either sulphuric or hydrochloric acid will do, three ounces of acid to two quarts of water); wash well under the tap from the acid, and dry with a clean cloth, and polish with wash leather. Now, on the unmarked side, pour a small pool of the waxing solution made by dissolving one drachm of yellow bees'-wax in three ounces of benzole. Spread it evenly with a clean linen rag, and polish with another with a light, brisk rub, till all smears are gone. The plate is now ready for coating; any good collodion which has been iodized some time will do. I use the Autotype Company's, and find it answer the purpose capitally. Rock the plate well to prevent streaks, and let the collodion set well before putting the plate into the bath. Do not use either a new or a strong bath; one which has been discarded as too old and weak for negative work is best. It must be acid with nitric acid, three drops of strong acid to a quart of bath solution. Do not hurry the plate into the bath. When well coated, drain well before putting it into the enlarging camera., The exposure will, of course, vary, with the light and the intensity of the negative, from five to fifteen minutes. I develop with iron. The formula stands thus:—

Protosulphate of iron	6 drachms
Glacial acetic acid	2 ounces
Citric acid	60 to 80 grains
Sugar-candy	30 ,,
Distilled water	20 ounces

With this developer you will not want to tone the transparency; it should develop very slowly, the deepest shadows in the drapery showing first, and as soon as the detail appears in the half-tones on the face, wash off quickly, and immerse in hyposulphite, four ounces to the pint of water. When fixed it must be well washed.

Before going on with the details of transferring, we will retrace our steps for further details. First the waxing. There may be some difficulty, when first using new plates, in stripping the transfer from the glass; it is necessary, therefore, with new plates, to wax and polish with particular care. See that every part of the glass is well smeared with the wax before proceeding to polish, and do not rub too hard in polishing; when the first transfer has come off you will find no difficulty in stripping afterwards. Next with regard to development. A great deal depends upon judgment used as to both exposure and development. Remember that a hard negative may be made to produce a soft transfer by a prolonged exposure with short development, and a brilliant transfer may be obtained from a weak thin negative by shorter exposure and prolonged development, and sometimes with this class of negative a great improvement can be effected by adding one ounce of water to two ounces of developer.

For transferring, I use the Autotype Company's double transfer paper. This is sold in bands. Cut it to the size of your glasses, and soak for twenty minutes in *clean* cold water; when your plate has been well washed from the fixing, transfer your paper from the cold water to hot, till the surface feels slimy, and place face down upon your still wet collodion surface, and squeegee down lightly but firmly from the centre outwards. When dry, they should leave the glass of themselves, but if they should stick at the edges, run a knife round, and they will come away. Mount with strong starch or thin glue upon stout board, and, when dry, roll well.

A collodion transfer made in this way is, or should be, both soft and of good colour, only wanting in depth in the deepest shadows, a fine engraving black, with a highly glazed surface.

And now comes the most important part, the working up or finishing. This I do with both chalk and pencil, and, if judiciously done, I find they are preferred to the loud oil daubings which is the characteristic of many club portraits; and they can be done very quickly. Any girl who is used to spotting prints could very soon get into the method of working these pictures, provided she had a little taste, and they are capable of the highest finish in artistic hands, with much less work than any other kind of enlargements.

First, for the materials required. (1) Pumice powder. This should be screened through a double thickness of fine muslin; a small quantity is sprinkled over the print, and rubbed lightly and evenly all over, till the surface of the print is matt in every part. (2) Conti crayon in cedar—red and black; that is, the outside of the wood is red with the harder kind, and black with the softer. I have found these are the best kind of crayon; they are of French make, and can be obtained at Rowney's, Rathbone Place; three black-lead pencils I use, the same maker's ever-pointed H, HB, and B.

Pin your print upon a firm drawing-board, and commence, with the softest crayon, to deepen the shadow of the drapery, following the photographic shadow. Don't mind if the crayon marks too much, for it can be easily softened, using the finger for a stump; when you have depth enough, go over it again with the point of the harder crayon, filling up and going over parts which may be broken. If the hair is dark brown, or black, it may, perhaps, need the same treatment with the crayon. Be careful to keep to the photographic shadows; your work is to strengthen and define existing shadows, not to put new ones in. If the operator can hatch, a few bold strokes of cross-hatching upon the background, over the shoulders, will give great effect. Now take your pencils; with the B pencil, the point of which should not be too sharp—a round blunt point—go over the deepest shadows of the face, strengthen and define the eyebrows, carefully noting and keeping the darkest parts of them in their right place, next the shadows under them, softening the pencil with the finger, in the same manner as the crayon. Next attend to the line of the eyelash, and the less-defined line of the upper eyelid above it; do not define this too sharply. Now carefully attend to the eyes, strengthening and defining the pupil and the dark line round the ball, carefully preserving the high and reflected lights. Generally speaking, the high light upon the eye will be too large and too bright; work on each side of it with the B pencil, and lower it with the H. Now the shadow down the nose, and under it, will want attending to, and the nostrils want deepening; then the upper lip and the line between the lips; then the chin and the shadow under it; and if the ear is seen, the deeper shadow of that must be touched upon.

Now, with the HB pencil, mend the shadows of the face, working from the deepest shades towards the lights, using the H pencil as you near the highest lights upon the face. This part of the work is the most important, and it can stop at simple mending, or can be carried on till the face is stippled all over with the pencil. If any part or touch of the pencil should be worked too dark, it can be brightened with a piece of bread, or removed altogether with ink eraser. If all this has been done, the picture now only wants the highest lights more sharply defined to finish it. This is done by scraping an eraser—such as is used by water colour artists is the instrument used—and this can be obtained of any artist's colourman; it must be kept as sharp as a razor. With this scraper it is possible to get great effect in the lights, the lights on the face can be brightened, the light in the eye, on the white collar, &c., can be brought out with a brilliancy which is surprising to those who do not know how it is done. It is best to finish throughout with chalk and pencil, but should some deeper touches be desired than can be obtained by the softer crayon, they can be put in with water colour carefully mixed to match the colour of the print, but used *without gum water*.

One word about mounting. Do not have a white mount round these pictures; a neutral grey or greenish grey mount, not too deep, is the best for them; and although instructions may read a little complicated, it will be found upon trial much easier to do than one would think from reading this description.

I did intend giving directions for colouring with oil, but I am afraid it would take up too much space, but I may at some future time make another "Topic" of that.

The "Topic" next week will be "Photography as an Aid to the Study of Geology," by J. Vincent Elsden, BSc. (Lond.), F.C.S.

PHOTOGRAPHY OUTSIDE THE STUDIO.

BY MAGNUS JACKSON.*

In exposing, as well as developing, my aim is always to get detail in the darkest parts of my picture, or, in other words, the deepest shadows; the same rule applies to photography as applies to drawing and painting, there being no shadows without transparency. I do not always succeed in getting full detail in the deep shadows, but when once on the plate, guard against losing it; more good negatives are lost by careless intensifying than by any other cause, the better lighted portions of the picture being made so dense that before they are deeply enough printed to stand toning, fixing, and washing, the fine details in the shadows are entirely lost. Next to exposure of the plate, I consider the intensifying the most important thing to study in getting good negatives. The developing is not nearly so difficult to manage; if rightly exposed and developer suitable, the development of a picture is both pleasant and easy. Many consider it a good thing to get a negative by the one operation, that of development—a thing to be desired, I think; otherwise I like to have it in my power to regulate the density of all my plates, either landscape or portrait. There is one class of pictures that seldom want any intensifying, and that is badly lighted or unequally lighted interiors. Many good pictures of foliage subjects are to be got in early morn in summer. Another advantage at that early hour is that great stillness generally prevails. This class of work entails a good amount of labour in pruning, and in tying back branches of other trees and shrubs that come within range of the lens; a good sized pruning knife is a very useful instrument to carry along with your other things. I have often to call in the assistance of the forester to assist in this operation. Were some trimming not done occasionally, it would be impossible to get your picture done; many of the best pictures which I have got would have yet been to do but for getting some operation of this kind performed. Most photographers have got taste enough not to cut or injure anything worth preserving, and I have always found the greatest facilities afforded me at all times for the prosecution of our delightful art by everyone with whom I have come in contact. I will close this part of my paper with one remark, and that is, unless one is prepared to exercise the virtue of patience, he need not attempt tree photography with collodion. I am in hopes that gelatine will enable us to get a large collection of beautiful pictures in the evening, when the effects are so good, and when everything is so still.

Interiors.—This is a branch of photography which is now popular, and likely to be much more so, since the introduction of gelatine plates. With collodion my mode of proceeding is to use newly iodized collodion, and the developer similar to what is used for out-door work; the plates for this description of work must be thoroughly clean, and coated with albumen or some other substratum. Exposure varies very much from one and a-half hours to ten to fifteen minutes; for dimly-lighted interiors, an hour is about the average time required, and to keep the plate in condition so long several things have to be done. First, the camera has to be damped inside, and some wet cloths laid on the bottom of the camera; this prevents the large amount of evaporation that would otherwise take place in hot weather, and the plate would be nearly dry long before the exposure would be completed. Other two things also require to be done—one is the thorough draining of the plate, and the putting of two thicknesses of blotting-paper on the back of the plate, these being well wetted. Where windows are in rooms that are being photographed face the lens, cover them on the outside, if possible, till within a very short time of the exposure being completed; shut the lens till the coverings are removed; then expose for a few seconds. By this means you get rid of solarization, and you get whatever is seen through the window in good detail. The use of mirrors for throwing light into the darker parts of interiors being photographed is very useful, and should be made use of when required; a great amount of detail is got by this means that otherwise would be lost. The same rule guides me in taking interiors that guides me with outside work, that is, expose for the shadows or dark parts of pictures.

Cattle.—It is seldom one is called on to photograph cattle unless there is something remarkable about them, either in symmetry or bulk. If symmetry is what has caused the breeder to have them photographed, I have pity on him who fails to show all the good points, and, at the same time, shows the bad ones, for objectionable points, as well as good ones, are found in all animals. To do this at any time is not easy work; but to those not experienced in this line it would be better for all concerned if they made no attempt to give a representation of the animals. My reason for saying this is, that few breeders will now allow their cattle to be photographed, just on account of the horrid representations that have been produced by many photographers. My first attempt in this line was in the year 1856, and in two days I made somewhere about twenty fine, rich-looking negatives, took them home, made good prints, the pictures being submitted to the gentleman owning the cattle, and he, knowing a little about photography, admitted the quality of work to be good; but not one was a good picture of the animals. This, to me, was very disgusting, and I made up my mind never to attempt anything in this line again till I had learned something as to how the animals should stand, and also to know the names of the different parts of their bodies. Before beginning to photograph any of this class of subjects, I go to where the animals are, either in the byers or fields, ascertain from the man in charge their different natures, and have them well cleaned, especially their feet. If their feet are not carefully cleaned, your pictures, however good in every other respect, will look very bad, owing to the matter adhering. Clean them well, and you have their feet clear and sharp in drawing. To give the man holding the animals encouragement to go on with the work, I ask him to bring me the quietest one first, tell him how I want him to hold the animal, and how to stand himself. In most cases, I succeed with the first two plates. This being done so easily, teaches the man in charge how to act, and, at the same time, some of the work is being done. Were I to commence with the most unruly first, ten to one the man is out of all patience before the picture is done, and then good-bye to success for the day. I endeavour to let the man in charge know that I am familiar with the work. This goes a great way to gain his confidence, and he does whatever I tell him with alacrity. I have no doubt a very large business would be done in this line if the foregoing remarks were attended to: not a gentleman proprietor, breeder, or farmer, but would have albums filled with photographs of all the different breeds of sheep, cattle, and horses.

There are a great many different plans adopted to get the animals to look steadily for a few seconds. These I will not mention, as to go into every detail would take up too much time. Horses, especially thorough-breds, require to be treated far more expertly than cattle, and require a great amount of patience on the part of the photographer. Grooms, for instance, are not so easily managed as cattlemen; they nearly everyone of them think they know more about horses than anybody, and their own way they will have if possible. I never fail getting over them. Go into the merits of the animal; ask the man to let you see how he stands; have a little good-natured argument with him; give him a little of his own way, but at the same time have it all your own, and you are sure to get his assistance. Go against his grain, and you are certain he will spoil your day's work; if he is the least out of temper or gets impatient, you are sure to fail in your attempts, as it requires all the care possible on the part of the groom as well as the photographer. There is another way, which is the last resource, to get a photograph of a horse. Draw a line on the ground, and have a mark to bring the animal up to, focus him there, then get the man holding him to give him a run; bring the horse up to the mark already spoken of; being all ready, if it happens that the position is good, expose the plate before he has got time to get restless. Many plans are tried to draw their attention. Were I to go over them it would make this paper too long. Morning is the right time to do this class of subject; if you attempt it in summer at mid-day, you are almost certain to fail on account of flies—if there is not one kind, there is another. Although I have succeeded very well with horses, it is the only branch of the whole business that I go in for, but that I dread, owing to the many difficulties to be surmounted. Dogs I will not refer to at any length—you all have experienced them, I have no doubt; only one bit of advice, and that is to get acquainted with them before attempting to get them photographed. Many a time I have had to defend myself from their attacks with my camera-stand in the one hand, black cloth in the other. One savage fellow was very nearly making mince-meat of me one day, and till I got a piece of beef to give him, so as to make friends, there was no use attempting him; this was the worst subject in the dog-line I ever experienced, and do not wish another like it again.

---

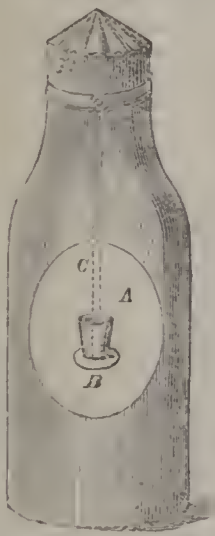
* Continued from page 44.

Post Mortem Photography.—This is a class of subject to which most photographers are entire strangers, as on the lighting of the subject nearly everything depends for successful work. I intended to have gone into this subject, but time will not permit of it at present.

A READY, USEFUL, AND INEXPENSIVE LANTERN FOR DRY-PLATE WORK.

BY THE "OLD HAND."

There are made, at the present time, for commercial purposes, glass bottles, of various sizes, with large openings at the top. If one of such be taken, and thick, coarse brown paper pasted round it, with the exception of an oval or square left in the centre, this oval or square to be coated with the ruby paper, or liquid ruby, a lantern may be produced that dry-plate photographers may work with in safety.



The light is got by cementing a small, flat-bottomed glass, or tiny tumbler, to a circular plate of tin, fastened to an upright rib that has a bend at the top to hang on to the neck of the bottle. In the glass are placed a little fine sperm oil and a floating night-light. The glass is coated with the ruby varnish, a tin cover is made to protect the top of this bottle-lamp, and, when all is complete and lit, it will be found to give a sufficient quantity of harmless light to work with.

Correspondence.

THE APPEAL FOR AID.

Sir,—In your appended note to James Syrus Tulley's letter upon the above-named subject, one is apt to imagine that you coincide in his grim and sneering opinions. In his first sentence he declares that "when people are indigent or sufficiently needy to appeal for aid to the public, it is usual to let us know who is going to be benefited." Truly, here is the kind Samaritan! Let us make the poor beggar crawl in the dust—let us make him know that he is a dog, that it is kindness on our part not to kick—let us lower his stomach, and make the proud rascal discover his name to the world. When this is done, and the profession find it to be a "deserving case, and they feel that any benefit or instruction has accrued to them" through the labours of the said lowly rascal, then, in Heaven's name, let Lazarus pick up the crumbs from the rich man's table.

If I mistake not, Mr. Editor, your own name figures among the first subscribers to the "Appeal for Aid," and, in my opinion, Mr. Tulley, before penning the bitter letter that I have just read, should have quietly applied to you, when I have no doubt that a full account of the *deserving case* would have been freely given him. Not only does he question the case as being deserving, but he attacks the few parties who have responded to the appeal, and howls at them as "gushingly benevolent" people, who only subscribe large sums that their names should be in print. A glance at the names will at once show how unjust and uncalled-for such a remark is.

That there are a great many undeserving cases of charity no one need try to deny, and that peregrinating assistants make frequent calls, we all know, and that they smell of tobacco and beer, and are seedy in raiment and down at heel. Yet is it not possible that a steady and persevering man—a man who has even been thirty years at the business—and who, from week's end to week's end, smells neither of tobacco nor beer—is it not possible, I say, that such a thing as misfortune may dog his steps—that bad luck may attend his utmost endeavour? And if death and sickness enter his home, and he sees nothing but ruin and starvation staring him in the face, is it any wonder that he applies to his fellow-workers? And what Christian would add to this poor man's sufferings by making him publish his name, and give an account generally of his past labours and troubles, as if he were a wealthy bankrupt whose statements were rather antagonistic to specific facts?

I hope Mr. Tully will not add me among his Jingoes who never paid taxes, &c., because, if he does, he will be wrong, albeit my means at present do not permit me to be among the few of the "*gushingly benevolent*" who delight to see their name in print!

Even if your "appeal for aid" was a case of the "Prodigal," Mr. Tully's remarks savour not of the fatted calf.—Yours respectfully, Beau Nash.

[This must close the correspondence.—Ed. *P.N.*]

SKIES IN PHOTOGRAPHS—PHOTOGRAPHY IN FLORENCE.

Dear Sir,—It has often surprised me, on seeing landscape and marine photographs exposed for sale that were excellent in every way save having no sky, why the sky was not added. Many of these, with even a plain graduated sky, would have made good pictures, while without it, they were merely common photographs.

This idea was forcibly impressed on me very lately when showing some photographs (chiefly of animals) to an animal painter in this city of art and artists. One of these was a group of horses with a simple graduated sky. He kept the photographs to show some brother artists, and told me this one had been much admired as such a picture with the sky. He was much surprised when I told him it was an artificial sky, as he believed himself, and told his brother artists, it was a sky photographed from nature.

Mr. Payne Jennings has a good article in your Year-Book that all artists will appreciate; and he knows that artists of the brush can admire a good photograph when it is artistic in feeling and made into a good picture. I always find this to be the case.

The photographers in Florence are great retouchers of their portraits. A lady artist told me that a portrait of her picturesque boy, aged three, and a beautiful subject, I know, had been retouched so much by one of the principal portraitists here, that she did not know her own son. But this is, perhaps, rather an exception, and an instance of too much "art" on the negative.

I believe the gelatine process is quite unknown here. I have seen no rapid work, no trains or steamers at full speed, no birds taken on the wing; but a notice of these photographic wonders was given in the *Italie* a few days ago. It is a paper published at Rome in the French language, and much read throughout the cities of Italy. This paper had several paragraphs on the improvements in photography (and the rapid work especially) shown in London last November.

I am anxiously looking forward to Mr. Morgan's new rapid argentic paper, and wish it all success. Quick printing, rapid enlargements, and Florence by moonlight, I hope to realise before long, following the lead of Messrs. Cussons, of Southport.

As regards sculpture and photography here. I have seen a very good life-like bust produced by a sculptor and photographer, whose name is well known, from a single photograph taken during life, and a cast of the face taken after death.

Mr. Stillman is the only gentleman I can hear of who has done some Platinotype printing here, and he has produced some very nice things from his own negatives, and from negatives of pictures, which have been much admired.

Florence is a desert as regards chemicals—they are as rare and as expensive as water in the "Sahara." I am developing my gelatine plates with chemicals supplied me by a benevolent lady amateur, who is a wet-plate photographer of experience and ability.—Yours truly,

Francis W. Turton.

AN EXPEDITIOUS METHOD OF DRYING GELATINE NEGATIVES.

Sir,—In the delightful article entitled "Priddy," in the News of January 21, the author of "Looking Back" parenthetically asks if there is no dodge for expeditiously drying gelatine plates.

It may be of use to some of your readers to know a way in which, if it be ever urgently required, a gelatine negative may be dried within a few minutes of the time it leaves the hyposulphite.

Rinse well with water; then place in a bath of methylated alcohol for two or three minutes. After this, flow freely several times with methylated sulphuric ether, allowing each time some of the liquid to flow off the plate. After this the negative will dry in a current of air in two or three minutes. If it has been in a bath of alum, considerable heat may be applied without doing harm. A cheap methylated sulphuric ether, which is useful for this and many other purposes, can be had for 2s. 4d. per quart. —Yours truly, W. K. Burton.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held on Thursday, the 27th ult., at the Free Public Library, Mr. J. H. T. Ellerbeck, President, in the chair.

The minutes of the last meeting having been read by the Hon. Secretary, and confirmed, the Rev. T. Lunt and Mr. F. J. Banner were elected members of the Society.

The **President**, having said a few valedictory words, vacated the chair, and

Mr. W. **Horseman Kirkby**, President for the current year, took his place, and delivered the following—

Inaugural Address.

"For the undeserved honour which you have done me by my election to this chair I must tender you my warmest thanks. I feel the honour and responsibility all the more when I consider how many of you are veterans in the study of our art-science, and would occupy this position in a much more worthy manner than I can hope to do; but I promise you to do my utmost to further the objects of our Association, and, at the same time, I must ask you to make allowance for any deficiencies there may be on my part.

"I have found it most difficult to find subjects of a practical nature to bring before you to-night. The process which is now carrying the day—to the almost exclusion of all others—is the gelatino-bromide, which, after some years of struggling infancy, has grown into vigorous manhood. Our Association can claim having given it fostering aid, for has it not been our Hon. Secretary's (the Rev. H. J. Palmer's) pet child? And when but few were experimenting with gelatine, has he not over and over again endeavoured to bring its beauties to our notice, till at length most of us have given up all other processes in its favour?

"Great advancement has been made of late in the point of rapidity; but I question whether this is of advantage except for special subjects, instantaneous marine views, and certain classes of portraiture, such as children and animals. I certainly lean to the opinion that for landscape, and such work as generally falls to the lot of the amateur, a moderately-rapid plate is the best, as then there is more likelihood of latitude both in the exposure and the development. The different aspects of the gelatine process, its advantages and its failings, have been debated most thoroughly in the journals; and, although improvement, no doubt, is daily being made, no very startling or rapid advance has lately been published.

"The addition of an iodide to the previously plain emulsion of bromide of silver, which was brought forward by Captain Abney, has led to a good deal of controversy as to the benefit derived. That it enables more light—and that not of such a distressing colour to the eyes as ruby—to be used both in its preparation and development, and also that it tends greatly to keep the shadows clean and the negative greatly free from fog is, I think, generally admitted. On the other hand, whether the plates will or will not keep any length of time, both before and after exposure, and whether there is or is not any loss of sensitiveness in its use, is an unsettled question. For my own part, I do not find any apparent loss of sensitiveness when from five to ten per cent. of iodide is added, and as to the keeping qualities time alone will show.

"Platinotype printing has not been brought much under our notice. The results being practically permanent, it is a process that ought to be more worked amongst us than has hitherto been the case, and I would suggest that those who have tried it should be asked to give us the result of their experience. Having been accustomed for so many years to the warm colour of silver printing—a colour which has been perpetuated as much as possible in carbon printing—the cold tone of the platinotype is not generally pleasing; but in this respect the *modus operandi* is being gradually improved, and platinotypes that have lately been exhibited are much warmer in tone than those shown when the process was first made public.

"I need not now further allude to the practical working of our art-science.

"The rules of art in the composition of pictures have not, I think, sufficient attention given to them by photographers generally. Artists—that is, the gentlemen of the brush—are loth to admit that there is any art in photography; but, if the subject of artistic composition were more attended to, I feel sure they would have to modify their opinion. How often one sees photographs, both by professionals and amateurs, defying every rule of art, with the principal object placed exactly in the centre, or the horizon dividing the picture into two equal portions. Very possibly both faults may occur in the same picture, or, perhaps, the foreground is a long, bare, piece of flat, unbroken ground, occupying half the plate, while the principal object is pushed upward till there is little or no sky to be seen above it.

"There have been many articles on this subject published during the last few years which will well repay careful perusal, and I can strongly recommend the critical study of the best paintings, both portrait and landscape, whenever opportunity offers, as most valuable in educating the eye on this point. Though I am but a novice myself in this branch of the subject, I think it well to draw your attention to it. It is really wonderful what a little study in this direction will do in the way of improving, perhaps unconsciously, the pictures we take. We gradually seem to discover intuitively the best points from which a properly-balanced picture can be taken, and the work we turn out will give us increased pleasure and satisfaction.

"Our meetings during the past year were very well attended, and although but few papers were read, they were, on the whole, very instructive; but I should be glad if more members could be induced to write papers, and so to give a more certain direction to our discussions. I know from experience how difficult it sometimes is to put one's ideas down in black and white; but I am sure that even short papers would be very conducive to the welfare of the Association. Some societies have a question-box, in which those members who are too diffident and retiring openly to bring subjects before the meetings can place their inquiries and enumerate their difficulties, and thus, under the cover of secrecy, obtain information. In this way it is quite possible that many interesting discussions may be initiated. I would therefore suggest that a question-box be tried, and if it do not lead to any good, it can easily be abandoned.

"I have for some time thought that it would be of great benefit if a course of practical demonstrations of the different processes could be arranged by the older and more experienced members.

This would be of much use to those who are beginners, or those who have had but little practical experience ; for otherwise, for want of a little assistance, should they meet with failures at the outset, they often give up in disgust, and we thus lose many who, in time, would make valuable members. It is natural that many of the elementary subjects are never mentioned at these meetings, it being taken too much for granted that we all know them, and therefore I believe that many new members do not derive the full benefit of their membership.

"We have now a larger number of members than at any previous time, notwithstanding that we have lost several during the past year—one by death—our late Hon. Secretary, Mr. William Murray, whom we could ill afford to lose. Everyone who came in contact with him must have seen how he made the interests of this Association his own. All must miss him from our meetings, and those who knew him more intimately will know how hard and willingly he worked for us, and how ever ready he was to give a helping hand to any who applied to him.

"I will now conclude by expressing the hope that this year's meetings may be the means of adding to our pleasure and progress in our art-science, and that the year 1881 may prove successful to us all, not only in the practice of photography, but in all other ways."

Mr. **Ellerbeck**, in thanking the President for his address, remarked that the use of the "question box," though excellent in theory, was wont to be neglected in the practice of meetings.

The Rev. H. J. **Palmer**, Secretary, called attention to the fact that the box in question was even then on the table.

Mr. H. **Houlgrave** exhibited some very perfect negatives and transparencies of engravings, and gave some account of his method of producing them. They were all taken by artificial light, and two lamps were employed for the purpose—one a three-wick paraffin lantern lamp, and the other one with two wicks.

Mr. **Day** passed round some prints from various fine negatives of snow and frost scenes.

Mr. **Ellerneck** exhibited prints from a negative on a Wratten and Wainwright plate, taken by gaslight, of the interior of St. George's Hall, Liverpool, during the recent *soiree* of the Associated Scientific Societies. The length of exposure was twenty minutes.

Dr. **Kenyon** then read a paper on "New Revolutionary Powers in Photography—Daylight Emulsification—Unlimited Heat" (see page 53).

On the motion of the Chairman, a vote of thanks was passed to Mr. Houlgrave and Dr. Kenyon for their valuable communications.

Mr. B. **Boothroyd** showed a negative and print on a Wratten and Wainwright rapid plate, taken at Southport in bright moonlight, with an exposure of forty minutes.

The Rev. H. J. **Palmer** gave an account of a recent visit to the studio of Mr. W. T. Morgan, Helio House, Greenwich, and exhibited two very fine pictures on the new gelatino-bromide paper. One was printed by gaslight, with an exposure of one minute, a foot from the burner ; the other was an enlargement by an ordinary paraffin lamp in thirty seconds. He (Mr. Palmer) then exposed and developed in the room a print from one of his Swiss negatives. The paper employed was some of that now sold by Mr. Morgan. The exposure was one minute, and the developer the ferrous oxalate. He (Mr. Palmer) mentioned further that he had made some excellent enlargements on the paper, with an exposure of thirty seconds, by means of the sciopticon.

Mr. **Ellerbeck** hoped that Messrs. Morgan and Co. would supply their new product on transfer and waxed papers, and thus provide workers in the field with a light and efficient substitute for glass in the production of negatives.

The Rev. H. J. **Palmer** then gave a report of the exhibition given by the Association at the recent *soiree* of St. George's Hall. Some four hundred and fifty prints of the highest excellence had been contributed by Messrs. T. C. Corkhill, J. H. T. Ellerbeck, J. A. Forrest, O. R. Green, J. Guyton, T. Higgin, H. J. Palmer, A. Tyrer, W. H. Wharmby, &c.

The Society might well be congratulated both on the artistic merit of the exhibits and on the interest and pleasure which they afforded to the very large numbers of persons who visited the photographic department of the Exhibition.

Prints by the Woodburytype Co. from negatives by Messrs. Beer, Boothroyd, Day, King, Kirby, Palmer, Twigge, and Wood were placed on the table for inspection.

The **Chairman** gave notice that every member of the Association who had paid his subscription, and would call at his (the Chairman's) office, might select eighteen in lieu of the presentation print for 1880. It was also announced that at the February meeting there would be a sale of the surplus presentation prints for past years.

The meeting shortly afterwards adjourned.

Bolton Photographic Society.

The January meeting of this Society was held at the Baths, on the 6th ult., Mr. R. **Harwood** in the chair.

Messrs. W. Taylor and John Swindells were elected members of the Society.

The **Secretary** placed before the meeting a circular from the Dundee and East of Scotland Photographic Society, announcing their Exhibition in October next, and was requested to obtain all particulars possible.

It was unanimously resolved that the Society hold a *soiree* in February or March next, and that a committee be appointed to arrange the details.

The **Treasurer** presented his report for the year ending December 31st, 1880. The vouchers, &c., having been examined, the report was accordingly accepted.

An adjourned meeting was held on Wednesday evening, 12th January, Mr. **Parkinson** presiding. It was resolved that the *soiree* be held at the Baths, about the last week in March. Various minute details having been arranged, the evening was occupied by examination of Cadett's instantaneous shutter and a new scenograph, both of which were explained by the Hon. Secretary. Specimens of work were also exhibited by various members. Votes of thanks were passed to Messrs. Marion and Co. and the Sciopticon Co. for their interesting exhibits.

Photographers' Benevolent Association.

The Annual General Meeting of this Association was held at 181, Aldersgate Street, on Thursday, 27th inst., Mr. W. S. **Bird** in the chair.

The minutes of the previous meeting were read and confirmed.

A letter was read from Rev. F. F. Statham, stating his inability to attend through ill-health, and wishing the Association success in its work. Messrs. T. Sidey (Nottingham), G. Hanson (Ashby-de-la-Zouch), T. R. Braybrook (Bradford), and Jas. P. Judge (Sheffield) were then elected members of the Association.

The Balance Sheet was next placed before the meeting, and the Chairman called upon the Secretary to give his report, of which the following is an abstract :—

"The receipts for the last year are higher than any other during the existence of the Association, viz., £42 12s. 6d., the disbursements being £29 14s. 9d., the difference £12 17s. 9d., increasing the funds from £74 9s. to £87 6s. 9d. Promises have been received from several members of the profession to assist by donations and honorary subscriptions could it be shown that the assistants were willing to help themselves. The depression of business has prevented several of the latter from joining the Association. Non-members had applied for assistance, expressing regret that they had not joined the Association when able to pay the subscription necessary to participate in any benefit, and promising to do so at their earliest opportunity. Every care has been taken to keep down working expenses, which this year are 20 per cent. below the average for the past four years. It has been remarked that expenses are out of proportion with receipts, but were the Society twenty times its present strength, the expenses of working would be but slightly increased."

Mr. **Ashman**, the Deputy-Chairman, then proceeded to read the Report of the Board of Management, of which the following is a summary :—

"From the accounts it will be seen that it is the best year the Society has experienced, though very far from what it should be. The Board of Management tender their sincere thanks for the support which has been received from honorary members during the year, and especially the liberal donation from Messrs. Window and Grove. The evening at the Exhibition resulted in a nett profit of £9 2s. 6d., for which your Board express their gratitude to the President and Council of the Photographic Society of Great Britain. The Board also record their thanks to the photographic press for giving publicity to the proceedings of the Association. That applications have been made by non-members for assistance proves that the Association would find plenty of opportunities to exercise its benevolent purposes, would those who may not at present require its aid but remember that some day misfortune may overtake them. Although at present the operations of the Association are confined to giving only temporary assistance, the Board desire to keep before the profession the subject of yearly pensions being added to the usefulness of the Association."

On the motion of Mr. Collins, seconded by Mr. Thorne, the balance sheet and reports were adopted.

The Chairman then remarked upon the position of the Association, expressing surprise that after several years, in which the Board of Management had succeeded in giving extended publicity to the objects of the Society, the assistants as a body had been strangely indifferent to efforts made primarily on their behalf. The Association was not a Provident but a Benevolent Society, and it was fairly within its scope to assist any member, master or man, in times of trouble and disaster. The photographic fraternity was one large enough and rich enough to provide an association like this with an income of at least £300 a year, and make it an instrument of kindly action in cases of misfortune, to which employers were liable equally with assistants. It was inevitable that with so small an income the expenses of management should compare unfavourably with the effective work done, but it was impossible the organization could be held together with less expenditure, while the administration of ten times the income would add but little to the outlay. At present the position of the Association was unworthy of the wealth and importance of the profession; but it was a beginning.

Mr. Ashman thanked the Chairman, on behalf of himself and members, for his kindly remarks, and said it gave him renewed vigour to continue the exertions which he felt sure would ultimately be rewarded.

Mr. A. L. Henderson said that the Photographic Club was making manifest their feelings towards the Association, by having a *soiree* and ball in aid of the funds of the Photographers' Benevolent Association, so that the Society would reap the benefit accruing from the undertaking without having any fear of a loss.

Mr. Bullock said that he believed the existence of the Association was but little known among the profession. He had only just become acquainted with the fact, although he had been connected with photography for some years, and expressed a wish to be enrolled as a member.

Mr. Bullock, together with Messrs. Napier and Lawson, were then elected as members.

The meeting then proceeded to election of officers, the following gentlemen being re-elected, and a vote of thanks for their past services carried unanimously:—

Vice-Presidents.—Rev. F. F. Statham and Mr. J. H. Dallmeyer.
Trustees.—Col. Stuart Wortley and Capt. Abney.
Treasurer.—Mr. H. Baden Pritchard.
Auditors.—Messrs. G. Taylor and L. Sisman.
Chairman.—W. S. Bird. *Deputy-Chairman.*—Mr. Thorne.
Board of Management.—Messrs. W. M. Ashman, H. J. Burton, T. Bolas, C. G. Collins, J. A. B. Hall, J. O'Conuor, A. Strivens, and R. E. Wilkinson.
Secretary.—Mr. H. Harland.
Travelling Agent.—Mr. W. E. Batho.

The meeting closed with a hearty vote of thanks to the Chairman.

Sheffield Photographic Society.

The usual monthly meeting was held at the Freemason's Hall, Surrey Street, on Tuesday evening, February 1st, Mr. Dakin, vice-president, in the chair.

After the transaction of the usual business, and the election of a new member,

Mr. F. J. Hall, who is about to proceed on a tour to Palestine, exhibited a new camera which he proposes to take with him, and pointed out its adaptability for the purpose.

The Hon. Secretary, while admiring the principle of securing the rising front by a spring, was afraid it would not be strong enough to carry a rectilinear lens of large size.

Mr. Dakin suggested that a reversing back for the dark slide would be an improvement.

Mr. Dakin, who had tried the new argento-bromide paper, then gave a short description of the mode of working, and, from his remarks, some of the members expressed their intention of trying it themselves.

The discussion then became general, and the meeting shortly terminated.

Talk in the Studio.

Photographic Society of Great Britain.—The annual meeting of this Society will be held on Tuesday evening next, February 8th, at the Gallery, 5, Pall Mall East, when the election of officers will take place, the report of the Council be read, and other business transacted. A paper "On Sensitometers" will be read by Mr. Leon Warnerke.

To Correspondents.

*_** We regret that the pressure on our columns this week compels the postponement of "At Home with Mr. Leon Warnerke," and Mr. Heighway's article on "Ferrotype."

Captain Turton.—You will see the paper spoken well of by the Liverpool Society.

Lime Light. 1. The arrangement you mention will answer very well, provided that the original negative is not too large to be properly illuminated by the condenser. 2. You had better consult Capt. Abney's Instructions in Photography, published at our office, as merely a few words of information on the subject would be of no service to you.

A Subscriber.—We cannot obtain the information for you in time for our present issue, but your query shall be answered next week.

L. B.—To do what you require is not very easy, but probably one of the methods ordinarily made use of for developed enlargements will suit you best.

O. A.—We are not aware that the article is to be bought in London, but you have perhaps some friend in Paris who can obtain what you require.

D. J. O.—Select some prominent object, such as a church steeple, and mark its position on the ground glass when the camera is at one end of the scale—say towards the right-hand side. Next shift the camera towards the extreme left, and alter the adjusting screw until the object once more corresponds with the mark on the focussing screen. The milled head of the adjusting screw should not be turned between the exposure of the two halves of the plate, and the focussing which serves for one position of the camera will naturally serve for the other position.

A. P. Chambers.—The phenomenon is probably due to the reversed action of light.

Fog.—Thin glue will probably answer you purpose best, but you must take care to saturate the calico with it, or unequal contraction will cause trouble.

Nemo.—Received. You shall hear next week.

Northumberland.—1. As the quantity of bath is so small, you will find it best to precipitate the silver by means of common salt or by hydrochloric acid, and reserve the precipitate until you have enough to be worth reducing. 2. The negative used being weak and thin, a better result would be attained by the use of a less concentrated sensitising bath.

Colin McNamara.—An acid solution of ferrous sulphate rapidly absorbs oxygen and becomes inert as far as its developing powers are concerned. Discard your jug and use a bottle, taking care that this is provided with a well-fitting stopper and cork. India-rubber corks answer admirably.

Learner (Ramsgate).—Fairly good. Light less from the top, and soften the shadows by means of a reflector, say a newspaper hung on a towel-horse. The marks are due to the presence of alcohol and ether in the bath. Pour it into a flat dish and expose to the air for a day, or evaporate to one half and make up to the original quantity with water.

J. L. Wakeford.—Perfectly dry carbon tissue may be exposed to the direct rays of the sun without being altered—but the dryness must be absolute.

B. L. F (Hanley).—You have evidently done the mischief by over-heating your emulsion in contact with a notable quantity of free ammonia. Try again.

L. M. S.—Much more depends on the common sense of the operator than on the particular formula which he adopts. In our hands, each one of the three you mention has given equally satisfactory results, but the second involves less trouble, and is therefore to be preferred.

C. Morgan.—It is of considerable importance that the tissue should be perfectly free from all tendency to insolubility; and to insure this the following precautions are advisable:—1. Sensitise in a bath which is strongly alkaline with ammonia. 2. Dry in a good current of air, and as rapidly as possible. 3. Take care that the tissue is not exposed to effluvia from drains or putrid matter. 4. Make use only of freshly sensitised tissue—that which has been kept some days will serve well for ordinary carbon printing.

M. E.—Try oxalic acid.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1171.—*February* 11, 1881.

CONTENTS.

PAGE
On Solvents for Pyroxyline 61
Emulsification in Daylight 61
Chloride of Silver Gelatine Emulsion. By H. L. T. Haakman 62
At Home 62
On the Value of Photography as a Critical Agent. By Rev. F. F. Statham, M.A. 64

PAGE
Notes 65
The Late J. R. Johnson 66
Our Artistic Competition. By E. Dunmore 67
Correspondence 68
Proceedings of Societies 69
Talk in the Studio 72
To Correspondents 72

ON SOLVENTS FOR PYROXYLINE.

We have been in the habit of looking almost too much in the same groove in the matter of collodion, and are perhaps inclined to imagine that a mixture of ether and alcohol is the best and only solvent for pyroxyline that can be found. No doubt these bodies have hitherto performed everything that is necessary for our use in the old wet process, but it may perhaps be of service to enumerate a few more liquids which may be pressed into the photographer's service. The first of all that we shall touch upon is methyl-alcohol. Our ordinary conception of this body is that it is a foul-smelling spirit, which even when diluted with pure ethylic alcohol (which is our ordinary alcohol) is bad enough, but which would be infinitely worse if breathed in an undiluted form. On the contrary, however, we find that methyl-alcohol in its pure form has a most sweet and pure spirituous smell, with nothing at all obnoxious about it; evaporates much more freely than ordinary alcohol, as might be expected from its vapour density, which is considerably less than that of ethylic alcohol. It mixes freely with ether, and dissolves more pyroxyline, when mixed in equal proportions with this latter fluid, than does a similar mixture of ordinary alcohol and ether. The flowing properties of the resulting collodion are everything that can be desired, and the film is of beautiful texture. The question arises if this collodion has any advantages over the old. From our own practical experiments we should say that it has. With the old form of collodion the ether evaporated before the alcohol, and in hot weather this, perhaps, was no disadvantage; but in cool weather a better film is obtained with the more readily evaporating solvents. In winter, we know, for instance, that it is often the custom to add ether to the collodion to give it a more rapidly setting film, but this is often done at the risk of injury to the film itself. On the other hand, by using methyl-alcohol, we have a film which sets more rapidly, and retains its qualities unimpaired. Abroad, larger quantities—tons, we may say—of methyl-alcohol are used in dye works. It is found that the aniline dyes dissolve much more rapidly in it than in ethyl-alcohol, and it is much cheaper there. Hence vats full of methyl-alcohol are used for the purpose of dyeing fabric, at a considerable reduction of cost to what otherwise would be the case. Unfortunately, our Excise laws are such that the importation of methyl-alcohol is rendered almost prohibitory; yet for photographic chemists it may not be so.

It must also not be forgotten that alcohol itself dissolves one constituent of ordinary pyroxyline. If pyroxyline be steeped in either methyl or ethyl-alcohol, a certain portion is dissolved up, which can be recovered by evaporating the solvent, and it will be found that this has distinct qualities from that left unattacked by it. In dry plate work it is the custom to moisten the film with alcohol and water to soften it. Besides softening it, there is no doubt that a portion of the film is dissolved away after such an application. The bottle used will often tell the tale, as a portion of the pyroxyline will precipitate in it.

We may say that many others of the alcohol series behave in the same way as methyl-alcohol, but their price is prohibitive, and there would be no advantage in their use since their vapour densities are higher. Some of the other ethers also have the same solvent power as ordinary ether, but the same objection holds to them. Methylic-ether is unfortunately gaseous at ordinary temperature, and except by passing it through an alcohol, or by use of a freezing mixture, no experiments with it are possible.

Another solvent of pyroxyline is benzine; we have not succeeded in dissolving it altogether in this menstruum, but only a part, and we have not thoroughly examined at present the character of the pyroxyline so dissolved.

Mr. Warnerke, it may be recollected, used a mixture of benzine and alcohol, to soften the film of his collodion-tissue; this *per se* is a solvent of the pyroxyline, and at the same time it softened the india-rubber film in contact with the collodion. Hence it played a double part. It is interesting to repeat an experiment also which Capt. Abney published lately. After having coated a gelatine plate with collodion, and allowed it to dry, he desired to intensify the negative beneath. He found that if he merely softened the film with alcohol, the intensifying mixture had not the slightest effect. If, however, the film were treated with equal parts of ether and alcohol, and then washed, the intensity was readily given through the porous film. In such a case the pyroxyline apparently becomes *insoluble*—at all events, difficultly soluble through its contact with the gelatine.

EMULSIFICATION IN DAYLIGHT.

Under certain conditions, which have been already set down in the pages of this journal, it is possible to obtain a high degree of sensitiveness in gelatine emulsion without risk of fog. That the conditions require to be carefully observed is undoubted, and it is also true, that when the greatest care has been bestowed on the preparation of an emulsion, from some unforeseen cause fog may supervene. It was, therefore, a relief to find that Dr. Kenyon had succeeded "in putting an end for ever to all elaborate and tedious precautions, in conducting the heating process, so far as danger of fog is concerned."

It was already known that certain substances eliminate fog, and that among these, bichromate of potash proved most effectual, and in no way detrimental, to the emulsion. Dr. Kenyon has further unfolded the properties of bichromate of potash as a fog destroyer, and as a safeguard against the dangers of prolonged boiling, and exposure of the emulsion to daylight before washing.

We have experimented with daylight emulsification, and not without success.

We were careful, however, not to expose the emulsion to the light more than was absolutely necessary. Our design, indeed, was to follow as closely as possible the method set down by Dr. Kenyon.

The emulsion was mixed in a white porcelain jar, the mixture being effected rather rapidly, so as to favour the production of a coarse-grained emulsion and fog. The boiling was conducted comfortably on the fire of an ordinary sitting-room. The emulsion was acid at first, and remained so as the ammonia liberated by boiling escaped freely out of the jar. Boiling was continued for one hour and a-half. Even at this stage, after boiling, the emulsion is comparatively insensitive to light; for all that, had it been subjected to the ordinary process of washing, it would have been found practically useless.

After washing in a solution of ten grains of bichromate to one ounce of water, in which the emulsion remained for one hour, we proceeded to wash out the bichromate.

The resulting emulsion proved free from fog, but not more rapid than that produced by short boiling and subsequent treatment with ammonia.

This result may have been due to imperfect elimination of the bichromate. As our experiment was by no means of an exhaustive character, this must remain a moot point for the present. It may be also in part due to the use of a small percentage of alum previous to coating the plates.

◆

CHLORIDE OF SILVER GELATINE EMULSION.

BY H. L. T. HAAKMAN.

It seems that the production of glass transparencies by means of an emulsion of chloride of silver in gelatine is meeting with greater attention.

About two years ago I devised a process which adds simplicity to good results; and at the time I forwarded a few sample prints on glass to Mr. Wharton Simpson. Possibly those samples may still be found somewhere in the editorial snuggery of the PHOTOGRAPHIC NEWS. As I never published my process, and I do not remember having seen anywhere a description of anything similar, the following may, perhaps, interest your readers.

I must warn them, however, that a method to produce and print by chloride of silver gelatine emulsion has been patented in England by somebody, whose name I forgot, and it may be that this patent is still valid. I never saw the specification thereof, and so it may be that my process is something quite different, and open to all; in which case I say you are heartily welcome to it. My formula stands as follows:—

Gelatine	5	grammes
Nitrate of silver	1½	,,
Chloride of calcium	½	gramme
Citric acid	½ to 1	,,
Water	100	grammes

Dissolve the gelatine (any good kitchen kind will do) in part of the water, and do the same with the chemicals in the remaining part, keeping, of course, each ingredient in a separate bottle. When the gelatine has melted (say) at about 100° to 115° Fahr., pour the silver into it first, well mixing; then the chloride calcium, stirring well, a little at a time; and, finally, the citric acid. The emulsion will probably turn red, but this does not matter. Whilst still warm, filter through flannel, and coat your plates in the usual way. No washing is required; and, in fact, it would spoil the plates, and deprive them of their sensibility.

The plates are laid on glass or marble to set, and afterwards placed in the drying-box to dry spontaneously. When dry, they are printed under negatives by contact in the same way as albumenized paper; only, as the prints are to be viewed as transparencies, and they lose much in fixing, they must be printed very deep.

When the emulsion is in good condition the shadows will bronze very readily, and the whole print gets proper intensity: but when the emulsion is bad, the print will scarcely come up to a dirty yellow, and then the shadows solarize. It is, therefore, a good plan, when the emulsion is made, and before coating the plates, to pour a few drops of the emulsion on a strip of glass, and expose this to the light. A good emulsion will speedily turn intensely black; a bad one solarizes, and turns yellow. In this case, more citric acid has to be added. With this simple precaution success is certain.

The prints have to be toned. I never succeeded very well with the usual gold bath, and prefer to use either the old *sel d'or* bath (hyposulphite with gold), or sulphocyanide with gold. This bath allows of a very great variety of tones—from sepia to engraving black. The toned prints are washed thoroughly, fixed in a weak hyposulphite bath, washed, treated with alum, washed again, and left to dry spontaneously. The printing may be done on matt glass; or the prints, when dry, varnished with a matt varnish, of which the NEWS has given several very good recipes.

This process has one or two advantages over chloride of silver in collodion. First, it is much cheaper; then, no fuming with ammonia is necessary; whilst last, but not least, there is no crystallization on, or in, the film.

With one print I obtained the curious phenomenon that, when taking it out of the printing frame, the foliage of the trees was green, a bridge yellow, and the water underneath greenish brown. I kept it as a curiosity, unfixed and untoned, and, after a year, the colours had remained. I have not opened the plate-box since May last, and, for all I know, the colours may still be there.

◆

At Home.

MR. LEON WARNERKE AT SILVERHOWE, CHAMPION HILL.

MR. WARNERKE'S house is not difficult to find, although the pleasant suburban neighbourhood is unfamiliar to us, and the shades of evening have fallen, as we climb the slope of Champion Hill. We know the thoroughfare, however, and we have been told we shall find the house plainly marked when we get to it; and so it is. Although darkness is beginning to enshroud trees and houses, the word "Silverhowe" presently shines forth on a gate before us in clear white characters. "The name is written in phosphorescent paint," explains Mr. Warnerke, laughing, when we congratulate him on the matter. How fervently we wish the plan were generally adopted in town and suburb Phosphorescent paint would save many a grumble at dinner-parties; fewer tempers and fewer dinners would be spoiled by late-comers.

Mr. Warnerke has just come back from a six months' sojourn in Russia, and as he contemplates a second journey to St. Petersburgh very shortly, we are fortunate to find him "at home." Mr. Warnerke is an indefatigable experimentalist, as every photographer knows, and since there is scarcely any branch of the art-science in which he has not engaged, a visit to him is unusually interesting. The only difficulty we experience is that of giving our readers anything like an adequate account of our pleasant reception, for as we move from one room to the other, chatting upon a hundred and one subjects, it occurs to us more than once—and very vividly, too—that our humble powers can but faintly reproduce the many interesting facts put before us.

This is Mr. Warnerke's chemical laboratory, a roomy apartment fitted with all the appliances of the modern chemist. There are no less than five Sprengel pumps in one corner, a portable gas-engine on wheels in another, apparatus for mixing rubber solution, for collodion making, for the preparation of phosphorescent calcium, and a vast paraphernalia of utensils of various kinds. A photographic laboratory, or dark room, is next door, and upstairs we find a room devoted to mechanics, for Mr. Warnerke is an able mechanician as well as chemist. Those acquainted with his roller dark slide know this; but only those who, like ourselves, have seen the most recent form of this ingenious contrivance, can fully appreciate his talents as a theoretical and practical worker. And this leads us to speak of the most important feature of Mr. Warnerke's recent investigations. The preparation of a flexible sensitive tissue of gelatino-bromide is now an accomplished fact, and we had the pleasure of inspecting not one or two film negatives of this description, but a series of one hundred. The series represented, too, the *first* negatives produced on the *first* batch of tissue; and when we say that of these experimental pictures, three-fourths at least were really good photographs, while of the rest, scarcely one could be pronounced bad, we have said enough to show that good times are, indeed, coming for photographers, and especially for those who engage in travelling and outdoor work. Having ourselves made practical trial of the old form of Warnerke tissue and roller slide, on two mountain tours, we feel at liberty to speak with some emphasis on the point; and if tissue as rapid and uniform in quality as the ordinary commercial gelatine plate can be prepared, we prognosticate a grand future indeed for Mr. Warnerke's recent invention. The new tissue, we are glad to hear, is made without india-rubber, the paper on which it rests being simply coated with gelatine; and the resulting film is so stout and durable that the negatives may be safely printed without a glass support, an advantage too apparent for us to dwell upon.

Our readers are familiar with the former roller dark slide. There were two rollers in a box, and the tissue as it was exposed, a small area at a time, left one roller to embrace the other. There was a tiny window or opening in the box, to enable the photographer to watch the progress of the tissue as he unrolled it, to bring forward a fresh piece for exposure; and by watching for numbers in succession, for instance, 3, 4, 5, 6, &c., he knew when the tissue was properly fixed in position for exposure. Our own roller slide held a strip of tissue enough for forty pictures, and not until this number of exposures had been made, and the number 40 appeared through the little window, was it necessary to replenish the apparatus. Obviously such an arrangement will not answer for a highly sensitive gelatino-bromide film; ruby and yellow glass combined would no doubt be sufficient to protect the tissue in the slide, but then it would be impossible for the photographer to read numbers on the tissue through this double thickness of glass. Mr. Warnerke, therefore, constructs his new roller slide differently. The long band of tissue, ere it is wound on the roller, is provided near the edge with a series of small perforations or holes. If it is a five-inch roller-slide, to take pictures five inches high, these perforations are punched at intervals of five inches. The tissue is now wound round the upper roller, and stretched down to the lower one, in which position it is ready for use.

We will now suppose the first exposure has been made, and the photographer desires to shift the tissue, so as to bring a second surface into the field. He revolves his rollers, by an ingenious arrangement that we need hardly describe in detail; the two rollers are set in action by turning one handle, and the tissue passes from one roller to the other. Presently a bell rings; it is the signal to stop. The perforation in the tissue of which we spoke just now has arrived at a certain spot, and a little metal stud comes into contact with a metal surface from which it has hitherto been separated by the tissue. A tiny chloride of silver battery, that finds a place, with the electric bell, inside the slide, furnishes the electric current, and the bell continues to ring so long as the metallic contact continues.

While admiring the ingenuity of this perfect little arrangement, many will be tempted to ask whether the rollers and the bell and the electric battery do not make up together a somewhat costly and elaborate bit of mechanism. The idea is very natural, especially by reason of our wordy explanation. But a glance at the apparatus suffices to dispel any fear of this sort. The bell is not much bigger than a thimble, the battery is equal in bulk to a couple of fingers, and the cost will not exceed one-fourth more than the sum formely charged for a roller-slide. The slide we were shown had its battery fitted in May last; it had done a journey to Russia and back, and been transported by rail, steamer, and camel, and served for the production of three hundred tissue negatives. Yet its power was still intact, and the bell obeyed the current immediately.

We should like to describe some of the pictures. Here are interiors, with all absence of blur about the windows—this is a most important quality inherent to the tissue—and here is a picture of the quays on the Dwina, taken from a moving steamer, Mr. Warnerke's camera being provided with one of Cadett's clever shutters. Here is a village dance by Russian women, their handkerchief head-dresses reminding one of Lancashire lasses. Here is an open-air theatre at Warsaw, the strangest spectacle in the world; the proscenium is surrounded by natural decorations, trees, shrubs, &c., with a space for the orchestra in front, while the auditorium, in amphitheatre-shape, is separated from the stage by a placid river which forms an effectual gulf between players and spectators.

Most of us are acquainted with the actinometer and sensitometer of Mr. Warnerke, but few know of the labour and calculations these cost to devise. In the case of the actinometer, indeed, the work had to be done a second time, for Mr. Warnerke's first calculations were based upon daylight in February and March, and when the summer time came, provision was found to be necessary for measuring light of much greater intensity. To ensure all instruments being of the same character—or, in other words, the deposit of coloured medium in the different degrees being all of the same thickness—Mr. Warnerke works from one standard only. Thus, having by means of paper layers built up his degrees of various thicknesses, he takes a cast of these in Spence metal. This, the original cast, represents the standard, and is carefully put away, after supplying moulds in plaster of Paris; like they do the original die of our sovereign at the Royal Mint it is kept as a record after it has served to strike off a matrix. From the plaster of Paris mould other impressions in Spence metal are taken, from which the scales are printed.

Spence metal has occupied much of Mr. Wernerke's attention of late, and in his hands it bids fair to become a most valuable photographic material. The suggestion first made* by us to employ Spence metal for photo-relief printing Mr. Warnerke was not slow to adopt, and he was good enough—as our readers may remember—to publish the results of his first experiments in these columns.† Since then, he has assiduously continued his investigations, and has prepared photo-relief or Woodbury plates of Spence metal, and fitted them in adequate printing-presses. As we have said, the scales of the Warnerke sensitometer are printed off from Spence-metal moulds. With the employment of Spence metal, Mr. Warnerke hopes further to overcome the stumbling-block which has stood in the way hitherto of producing large Woodburytype prints. The difficulty of getting large metal surfaces truly flat is almost insurmountable, and if printing surfaces are not true in Woodburytype printing, an unevenness in inking results, and uniform pictures are unobtainable. But the easily-molten Spence metal will supply any number of flat surfaces without difficulty, if care is only taken to cast it upon a true level; while the delicacy of its impression may be gathered from the fact that a finger mark upon the mould is reproduced in the Spence cast in the most perfect manner.

---

* See "In and Out of the Studio," page 133, vol. xxiv.

† See page 200, vol. xxiv.

Mr. Warnerke was good enough to show, too, how he printed his black figures on the sensitometer, and as photographers may sometimes find it convenient to be able to print letterpress on a glass surface, we communicate his ingenious method. Mr. Warnerke makes use for the purpose of an ordinary clothes-wringing machine, provided with a rubber roller. What is wanted on the glass surface is printed first of all on paper in a printing-press in the usual manner, and then, while the ink is still fresh, the paper imprint and glass plate—face to the glass—are passed through the wringing-machine at considerable pressure. There is no risk of breaking the glass, and, if the pressure is sufficient, the print-off is exceedingly black and clean. If the ink is dry on the paper before it can be used in the wringing-machine, no doubt a little turpentine rubbed on the back would at once facilitate its transfer.

Mr. Warnerke, besides the preparation of his new gelatino-bromide tissue, is also busy establishing the preparation of gelatine plates in Russia; and we may mention that Nelson's No. 1 flake gelatine and ammonium bromide are the staples he prefers in the production of the sensitive film. The gelatine in question, in his experience, is much more free from "plague spots" than any other description with which he has worked, a dictum that many of our readers will be glad to note.

Here is a pencil, for marking on glass, that our host uses; chemists and photographers know how difficult it is to scribble memoranda, or even distinguishing marks, upon beaker, test-tube, or glass plate. If a diamond is employed, the marks cannot be removed; if ink, or ordinary pigment, then the marking is often illegible, and very liable to come off. Composition made up as follows, and used as a pencil, answers admirably: equal parts of bees wax, fresh tallow, and vermilion are mixed together intimately, the former being in a melted state, and then poured in this condition into the pencil or mould; more tallow is used in winter, and less in summer.

"By-the-Bye" next week will be "About Medals"; the following "At Home" will be "Dr. W. Huggins, at Upper Tulse Hill."

◆

ON THE VALUE OF PHOTOGRAPHY AS A CRITICAL AGENT.

BY REV. F. F. STATHAM, M.A.*

PERHAPS no modern art has had to fight its way to public favour through so severe an attack of criticism as photography. Though recognised at once, on its first introduction, as possessing undoubted merits, during its earliest years it was more as the fascinating recreation of scientific men, than as a pet of the multitude, that it gradually won its way to popular favour. This fact is no doubt to be accounted for by the circumstance that at first all the efforts of photographers were tentative. They did not—all at once—present to the public gaze, results from which a fair judgment of the future capabilities of the art could be formed.

Their stock of chemicals was limited; their apparatus, in many instances, rudely or imperfectly constructed; their lenses inaccurately ground; and as yet many valuable secrets of manipulation, only to be learned by long training and experience, had not been divulged, so that the most conscientious workers even were placed at a great disadvantage.

Then, again, there was something in the very nature and essence of the whole proceeding which at first told sadly against it.

It was too truthful; it spared no defects, flattered no vanities, but bravely took the field (like a bold reformer, as it was), and challenged the truthfulness of the styles of portraiture and of conventional landscape painting which had too frequently passed for genuine in the earlier portion of this century.

The wholesome, natural looking portraits of Rembrandt and Maes, of Vandyke and Murillo, had given place to the fashionable school of Sir Thomas Lawrence, and the imitators of Sir Peter Lely, and every blemish upon the human countenance was skilfully omitted, or toned down, till the likenesses of our great public characters were rather to be regarded as tasteful imitations, than as faithful reproductions of their originals.

The reign of the neat, and pretty, and the pleasant, which had had so long a sway in ivory miniatures, had established, I will not say a vicious, but an unnatural bias in respect to portraiture, so that when photography first came forward—not with its present improved processes and apparatus, be it observed, but labouring under almost every conceivable disadvantage—to give truthful, but in many instances very imperfect, transcripts of the "human face divine," it is not to be wondered at that many severe critics were found, who predicted nothing but evil concerning it, and for a long time prevented its attaining a full measure of public favour.

Our English artists were not quite so plain-spoken to their customers as was the Chinese photographer, who, in reply to the sea captain who was grumbling at his likeness, remonstrated, "Ay, ah! s'pose man got ugly face, no can hab pretty pictur;" but the facts remained the same, nevertheless.

A wart on the nose, or a scar on the cheek, or a wry mouth, or an obliquely glancing eye, would present itself faithfully upon the "carte." Artists had not as yet discovered the mysteries of clever lighting, or ingenious posing, or skilful "touching" so as to modify or conceal these blemishes, and, as the result, photography, being critical itself, begot a spirit of criticism on the part of the disaffected, and, as I have said, had a long and a fierce struggle to fight its way to the front.

Now, I am not about to acknowledge that this truthfulness of rendering is any defect in the art. On the contrary, I should feel rather inclined to argue that it constitutes one of its great merits, and beyond this, I don't think I should be far wrong if I were to say, that this very quality in photography has done good service in improving our national school of portraiture in oil.

Let anyone compare the life-like portraits of Millais or Ouless, or Richmond or Sant, with the prettinesses of the former school to which I refer (for I am not speaking now of our good old English school of the time of the Hogarths, the Gainsboroughs, the Opies, the Romneys, and the Reynolds), and then let him ask himself what has restored to our canvases the vigor of an earlier and a purer age. I verily believe it is due to the faithful presentments which photography has rendered familiar in our own day. When such splendid examples were to be seen upon the walls of our exhibitions as have been furnished by Adam-Salomon, Valentine Blanchard, Downey, Slingsby, Robinson, Faulkner, and a host more (many of them members of our own Society, of whom we naturally feel proud), it was almost infallible that the votaries of the earlier and (I will grant it honestly) nobler art should look to their laurels—paint more carefully and more closely to nature—in a word, get rid of that conventional flattering system of treatment which had almost eaten out all vigor from our national school of portraiture.

But now, having said thus much by way of apology for what, after all, we must confess to be the critical character of our art, and having, I hope, slightly blunted the edge of any prejudice which may still exist against it on this account, I should like to go one step further, and express my conviction that the usefulness of photography as a critical medium is only still in its infant state.

Let us imagine for a moment that we had succeeded in removing from the minds of painters, both in water-colour and oil—aye, and of architects and sculptors too, if you will—every lingering trace of prejudice against, or ill-will towards, or even indisposition to avail themselves of, the processes of photography as an adjunct to their several branches of imitative art. Let us fancy that we have fought our battle of obstruction triumphantly, and gained the victory; that the camera, instead of being looked down upon by our R.A.'s and A.R.A.'s, was regarded rather as a useful friend; that the artist, when going to the moors, or the lake districts, or the mountains, or the seashore, made a point of taking a camera and a few dry plates with him: do you honestly think, my friends, that he would be a loser by the bargain? I do not. I think I could suggest how, in a variety of ways, it might be, on the contrary, a source of great usefulness to him. In the first place, he would want to select the most eligible point of view, and of course an artist's eye would soon tell him intuitively from what precise spot to select this. But then the whole landscape, spreading wide before him, has to be reduced to the dimensions of the sketch-book that he carries, or of the canvas upon which he proposes to work. Now all this, as we know, is a matter of strict perspective law. Every object in its separate outline must fill an exactly proportioned dimension; must come in in regularly converging lines; in a word, to be true to nature, must be also mathematically true, although the real artist knows how to effect all this without its being noticeable, in accordance with the well-known dictum, "*Ars est celare artem,*" which may be freely rendered, "The true aim of art is to conceal its processes or modes of action." But to carry out this object, what an amount of care and observation is necessary; and we know that sometimes even a small mirror of obsidian or other reflecting substance has been found useful in getting all these numerous lines into their right places, and in assigning their respective magnitudes to the several objects sought to be delineated.

---

* Read before the South London Photographic Society.

Now, might I be bold enough to suggest that, if any artist wished to save himself a great deal of time in making his preliminary sketches, a portable camera with a few accompanying dry plates would be of the utmost service to him? The camera is most faithful in the art of perspective, and as the artist would require to use it only for the purpose of gaining hints or of saving time, he needs spend very little trouble over the process; or with our new gelatino-bromide plates he would soon learn how to expose, and he would find plenty of photographic firms ready to develop and print for him on his return home.

"Oh, but this would be deregatory to his art!" some would say. The old painters would not have said so. Many of them ground their own colours, and made their own brushes, because they could not buy them ready-made to their fancy; and, for my part, I think the sooner we learn to avail ourselves of every available means for attaining perfection, and get rid of all notions of the lowering of art by such means, the better it will be for our ultimate success.

Demosthenes was a natural-born orator, but he did not despise the common pebbles of the sea-shore, when he found that by putting them into his mouth and delivering his orations to the waves he could improve his original indistinctness of speech.

Then, again, what a useful assistant the camera would be in catching the evanescent effects of light and shade, or the shapes of clouds, or the ever-varying phases of the rolling ocean!

I can well conceive (for I am a little bit of an artist myself) the disappointment which must come over the mind of a sketcher when some sudden burst of sunshine from behind a cloud, or some wondrous atmospheric effect of sunrise or sunset, has entranced him, and he feels it rapidly passing from before his gaze before he can chronicle it with his brush or pencil. Well, if he had his camera at hand, arranged as it would be, to seize upon any sudden emergency of this character, there—at once—in an instant or two—before the effect could vanish—sufficient trace would be left on the sensitized plate to act as an "aide-mémoire," and bring back to his mind all the glorious experiences of those few brief entrancing moments.

Or say, again, that he is working in his studio, that he is troubled about the folds of some drapery, or the proper arrangement of some flowing garment. How will it look when transferred to the canvas? He tries it first in this light, then in the other. He moves to one point of observation, and then to a second or a third, and spends, perhaps, many minutes, or even hours, in settling what one glance almost at the ground glass of his camera would have told him at once. And then if, when his fancy is satisfied, he fixes it immediately by exposing a plate, there again is the brain-memorandum which will look him in the face whenever he wants to recal the exact look which seemed so gracefully to fall in with his idea and to fulfil his wish.

Or again, say that the texture of the fabric which he wishes to represent puzzles him, for artists are obliged to be particular in rendering this also more accurately since photography has shown them how it ought to look. Is it frieze—or tweed—or flannel—or fustian—or broadcloth? One uniform flat tint of the requisite colour used to do service for all these, or corresponding fabrics, in the olden time. But look at one of Tademas' or Faed's pictures now-a-days, and note the difference, and will you try to persuade me that you would not be able to imitate the exact texture of a poacher's corduroy jacket, or an Irish emigrant's frieze overcoat, more readily after having seen how it looks in a photograph? I can imagine, on the contrary, that without any base servility to copying, the exact photographic counterpart might be a most useful reminder, and might be most justifiably used to correct, or, if you will, to improve, the impression already made by the retentive eye.

And if this be true with regard to articles of drapery and clothing, how valuable also would be the critical aid of photography in determining the play of reflections upon polished surfaces (in itself a very difficult thing accurately to define)—how useful in giving an image of ever-varying foliage of the never-ceasing changes in the aspect of rocks, and fields, and skies, and woods.

I can conceive that a good portfolio of photographs containing numerous details of all these several objects, whether natural or artificial, to which I have alluded, would be highly useful, even to our best and most accomplished painters, sculptors, and draughtsmen; and I therefore congratulate the artistic world on the progress which the once-despised art of photography has recently made in public opinion, and doubt not that before the end of the century the use of the camera will be one of the branches of elementary study demanded of all candidates for the higher branches of representative art.

Notes.

Last night Captain Abney read an interesting paper before the Royal Society touching some important results he has recently obtained in spectrum photography. His experiments relate particularly to organic chemistry, and are likely to upset some of the recognised theories of our chemists; here is one instance the more of the value of photography in scientific research.

The South London Photographic Society is to be commended for its efforts to improve art in photography. What the Sketching Clubs do for painters and draughtsmen, the Society, by its monthly art competitions, is striving to do for the photographer. The President says what shall be the subject of the composition, and each competitor embodies the idea to the best of his ability, sending in his work at an appointed time for examination and exhibition.

Now that a medal has been awarded to Mr. F. Helyer for the best composition during the year, we may hope that the competitions will become still more popular. Mr. E. Dunmore suggests whether it would not be wise to make the competition more open. We think it would. In promoting such a good work the members of the Society would probably be only too glad of the co-operation of photographers outside their circle, while the scheme is one well worthy of an association of eminence meeting in the metropolis. If the South London Society can induce photographers throughout the kingdom to contribute, the art competitions will rank as one of the most important steps yet taken to cultivate art photography, not only in this country, but throughout the world. The Society have hit upon a good thing; let them not fail to profit by it.

In some of the first studios, it is the practice to have but one camera and stand in the whole glass room. Other apparatus is religiously put out of the way, since it is only an incumbrance when not actually in use. Mr. H. P. Robinson, of Tunbridge Wells; Messrs. Hills and Saunders, at Porchester Terrace; Mr. Mayland, in Regent Street; and Mr. Midwinter, at Bristol, may be cited among others who are particularly prone to making a clean sweep of their studios.

Dr. Gwyn Jeffreys, F.R.S., evidently does not think submarine photography altogether impossible, for he says:—"We do not know to what extent the sun's rays penetrate the sea, nor whether the bottom at all depths is absolutely devoid of light. An ingenious apparatus, which was contrived by Dr. Siemens for ascertaining the presence of light at different depths by means of highly sensitive photographic paper, has never yet been properly tried. An experiment of this kind, made by Prof. Forel, proved that in the Lake of Geneva, even at a depth of only thirty fathoms, the paper was entirely unaffected after protracted exposure. But the water of that lake is peculiar; it is said to be rendered less transparent by suspended and floating particles of mica brought from glacier streams, and to have thus acquired its deep blue colour. I cannot believe that the only abyssal light, if there be any, is phosphorescent."

Moonlight photographs still seem to be the order of the day. A most successful picture, taken on an eight-inch plate by Mr. Dunmore, was put into our hands the other day. It was a suburban view, the snow lying thickly on adjacent roofs and in the gardens, and thus contributing by its reflection to give additional effect to the landscape. A church tower in the distance, and a poplar in the foreground, were rendered with surpassing harmony; and altogether, for detail and softness, Mr. Dunmore's moonlight sketch is really wonderful. The exposure lasted from seven in the evening until midnight.

It is sometimes useful to know how to impart a finely-ground surface to glass suitable, say, for a focussing screen. Mr. C. S. de Joux good-naturedly sends us, all the way from Mauritius, a simple method he has practised, which certainly deserves to be recorded. Finely-ground sand or river mud—or, what is better still, the sediment from a grindstone—is well stirred up in a bowl of water, and after a few minutes the upper half of the liquid decanted off. The decanted liquid contains all the finer particles, and these, after subsiding, are collected in a watch glass.

The sheet of glass is laid on a damp cloth spread upon a table, and the watch glass and mud used as a muller, the convex side of the watch, glass supplying a good hold for the fingers. In a quarter of an hour a satin-like polish will be obtained, admirably adapted for focussing. A rinse with water will show if the grinding has been uniform.

One of the principal difficulties that besets the Woodburytype printer is that of securing a paper proper to receive the impression. The material must be exquisitely smooth and flat, and without pores, qualities usually brought about by treating the paper first of all with shellac solution, and then subjecting it to great pressure between steel rollers. Steel rolling-machines are, strange to say, rare in this country, but Mr. Warnerke, during his last visit to St. Petersburg, has been fortunate enough to discover, in one of the Russian paper establishments, machinery which appears to be particularly suitable for the manufacture of Woodburytype paper.

A simple way of waterproofing cardboard. Mix four parts of slaked lime and three parts of skimmed milk with a little alum. Apply two coatings of the freshly-prepared compound to the card.

We gave an example the other day of Yankee advertising; here is one from Paris. A young man of birth and fortune is to be introduced to a suitable *partie.* "I will show you her portrait," said a friend, and he produced a group of two ladies; "here is mama too, so you will see how the young lady will grow up." The aspirant took the picture and examined it closely for some moments; then he said, "Which is the mother and which is the daughter?" The photograph was by the clever French artist, Poudre de Riz, and, thanks to his skill, the mother had been rendered as youthful as her daughter.

THE LATE J. R. JOHNSON.

Mr. J. R. Johnson, a chemist and experimentalist, well known in the photographic world, died on the 30th January last, at Warwick, aged sixty-four. His name is more particularly connected with carbon printing, his double transfer process, without the aid of rubber or any other adhesive material, which he first published in 1869, contributing in some degree to make Mr. Swan's original process more widely known. Indeed, Mr. Johnson took an active part in the process of carbon printing from its inception to the period when the English patents and the prestige and property of the Autotype Company became vested in its present proprietors. He was an acute diplomatist, and succeeded in creating an Autotype Company to purchase and work the patents of Mr. Swan in England.

About the same time he negotiated the sale of the patents for France to Adolphe Braun, of Dornach, cleverly settling with Poitevin some rival claims over French territory.

From 1868 to 1872 Mr. Johnson devoted a considerable portion of his energies to autotype; he was a sort of managing director, planning and superintending the erection of the works at Ealing Dene; lecturing before learned societies; doing the necessary literary work; and endeavouring to convince Royal Academicians that autotype was to supersede engraving for the production of their works.

The factory at Ealing was erected on the supposition that carbon would be king, that a profitable business was to be done in the sale of tissue and transfer papers to licencees, and that the new process would monopolise the photographic reproduction of works of art. Suitable rooms were leased in the Haymarket for the display of autotype art, and subsequently a fine gallery erected in Rathbone Place for the purpose. But both the profession and the public were slow to acknowledge the advantage of autotype, and despite the efforts, practical and literary, of Mr. Johnson, the losses achieved by the company up to 1872 were computed at £25,000.

At this period Mr. J. R. Sawyer was making some decided advances in the collotype or Lichtdruck printing, and Mr. Johnson was quick to perceive the mercantile chances of the process. He was employed to make overtures to the firm of Sawyer and Bird, and carried through an arrangement which added collotype printing to the business of the Company.

This accomplished, Mr. Johnson endeavoured, with complete success, to modify the somewhat hostile attitude assumed by the late J. A. Spencer in matters autotypic, and enlisted his energies in the cause. This infusion of new blood led to important results in the constitution of the Company, and enabled Mr. Johnson to receive some substantial benefit from his long service to the cause of permanent photographic printing. Mr. Johnson retained his double transfer patent for France and the United States, and having a special invitation from an English capitalist in Paris to undertake inventive work, determined to fix his residence for a time in that capital.

It must not be supposed, however, that carbon printing absorbed very much of Mr. Johnson's time. He was a man of varied activities and original ideas. From the action of bichromate of potash on gelatine he conceived the idea of its application to fatty lubricants. There was a difficulty in those days of making a grease suitable for the wheel axles of railway carriages: a higher melting point was needed without deteriorating the fat. This Mr. Johnson arrived at by the action of bichromates on organic matters under the influence of light, and demonstrated its success practically at the soap works of a City firm, arranged for a certain royalty per ton, and derived from this source for some years an income varying from four to seven hundred pounds.

He invented and patented machinery for improving and economising the founding of type, and about the expiration of the patent, after fourteen years' work, was convincing the printing trade of its merits. He applied to the Lord Chancellor for an extension of the patent, proved his case in court, obtained three years' grace, and was then able to dispose of his rights, and obtain at last a reasonable remuneration for his years of thought and labour.

He acted as consulting chemist to several mercantile firms, and exhibited much ingenious capacity in dealing with problems submitted to him.

He was the inventor of one of the most ingenious pantascopic cameras; and it was with his instrument the house of Braun and Co. obtained their celebrated panoramic views of Switzerland.

The present writer many times visited him in the charming little villa which he till recently occupied among the pleasant gardens of Neuilly, near Paris. Johnson loved a garden, was a practical horticulturist of great ability, and no man could raise on a limited spot of earth more fruit and flowers than himself. He was an authority on the grafting and training of fruit trees, and it was an instruction and delight to look over his grounds in summer and autumn.

Mr. Johnson knew how to play well the part of host; a bit of a gourmet, with a practical knowledge of cookery as a fine art, ensured the creature comforts in perfection; while his sense of humour, his love of a joke, and varied reading and experience, always made him an entertaining companion.

OUR ARTISTIC COMPETITION.

BY E. DUNMORE.[*]

Rather more than twelve months have elapsed since the inauguration of our monthly competitions. As a well-wisher of the scheme, I think that a few words respecting them will not be out of place, especially as our Secretary has asked me for a paper of some kind for this evening's meeting.

Taking, then, "Our Artistic Competition" as a text, I will separate it into three parts, for more convenient handling, and treat each part as a question to which an answer is required. The first shall be—Are such competitions of any use, our judgment being guided by the results of this experiment? Secondly—Why should so few pictures, comparatively speaking, be sent for competition, and why so few members take part in it? Thirdly—In continuing this scheme, would any modifications of the rules help to a better and more successful issue?

These are the three divisions, and I will now take them seriatim. First, then, the use of such competitions. It seems to me that they ought to be of the greatest use, if the artistic qualities of photographic work be sought after or desired. That competition in any kind of art always tends to improvement is a mere truism. Therefore, why should photography, in this particular instance, be an exception to the rule? These remarks may possibly be thought to indicate that our scheme has been a failure. I am happy to say that it is fortunately not so, as witness the pictures before you this evening; but, at the same time, there is no denying that the success has fallen short of, perhaps, I may say, our too great expectations. Partial successes as they are, they have been sufficient to encourage and induce your Committee to continue them for another year. I had hoped that at least there would have been twice as many contributors, and many more works forwarded for competition. I feel at a loss how to account for or explain the fact that such a promising commencement should end with such a meagre list of contributions. Gentlemen have joined this Society for the express purpose of becoming competitors, and yet but few more than thirty pictures have found their way to the hands of the Secretary during the first year. It seems an indication that few of our members believe that competitions are of use; others, however, think differently, and have sent in their quota of pictures, of which some are admirable examples of the photographic art, and pleasant to look upon.

When we consider the difficulties that have to be surmounted in moulding our photographs to suit or illustrate a given word—which is more difficult, I need not say, than the reverse process of fitting a word to a photograph—the success achieved must be considered great and extremely praiseworthy; therefore the small number of pictures is in some way compensated for by the excellence of many of those sent. I feel no doubt in my own mind that, although the awards that will be made are comparatively small in actual money value, yet the honour and credit gained by the recipients will be sufficient to induce many more to enter the arena, and compete, during this second year of the experiment, for the honour of the thing, be the pecuniary value of the rewards ever so small. These will be in a manner regulated by the enthusiasm and energy shown in carrying the scheme out. A good show of pictures, numerous, varied, and good in quality, acts decidedly as a stimulus to those who hesitate as to whether they will become exhibitors or not, and as an inducement to them to send in. But, on the contrary, when few are shown, the very fewness exercises a depressing influence, and checks any incipient inclination of adding to the display. That "nothing succeeds like success" is a very true adage, and, in this instance, could members only be induced to put a little more spirit into the matter, and if only half, or a third, or even a fourth of the members become contributors, the success would be assured. The use of such competitions is, I think, undeniable, and their value accumulative. This Society has been considered for years to specially encourage the art side of photography; and what could be better than having in their possession such a series of clever photographs of various kinds—photographs to which old members could refer with pride and satisfaction, and from which the younger ones could obtain hints and information as to how difficulties were overcome and success achieved? I am in hopes that eventually this scheme, if really adopted in spirit as it is in fact, will conduce to this result, and benefit not only members of this Society, but photographers generally; those, at least, who have any love for their art besides that of making money by it; even to these, good work—which such a scheme fosters and encourages—is a powerful means of gaining this end, and, as far as I can see, from whatever point it may be looked upon, the use of competition in things artistic is undeniable.

Secondly.—Why should so few send in works for competition? This is a question easily put, but there is considerable difficulty in answering it in a manner at all satisfactory to myself. It is to be hoped fear of failure is not the cause, or that the value of the awards at the completion of the year was too vague and indefinite to cause members to think the game worth the candle. I think that when the awards are made, and the reasons that regulate their value fully understood, it will be considered quite worth the while of any member to do his best to attain them, by sending in the most skilful contributions he is capable of producing. It is a moot question whether it would be advisable that each competitor should pay a small entrance fee, or that new members should, on payment of a fee, be allowed to enter on the list of yearly competitions, the amounts so paid to be entirely devoted to the Prize Fund, the purchase of medals, or further elaboration of the scheme. The funds of the Society, unaided, are insufficient to warrant much expenditure for this purpose. The members are aware, with such a small subscription as ours is, the Treasurer has his skill taxed to keep a moderate balance in hand, after paying the working expenses of the Society. It is, I believe, a general feeling that the presentation of a medal would be the most appropriate award, and I am in hopes that this end will be attained, and that the possession of the medal for artistic photography of the South London Photographic Society will be sharply contested, sought after, and valued above all other medals connected with our art, and valued as an acknowledgment of the skill of its possessor, beyond all cavil and question, and one that can only be repeatedly obtained by genuine and unmistakable artistic genius. It remains entirely with the members of this Society to decide if this desirable end shall be attained. The competitions, being so far limited to members, with them alone rests the power of conferring a distinction that would be prized wherever photography is practised.

---

[*] Read before the South London Photographic Society.

In the third place, can any modification of the scheme tend to popularise and induce a more spirited and hearty co-operation of the members? "In the multitude of councillors there is safety," and probably some here present may have suggestions to make that the committee may deem it advisable to adopt. The present rules are most liberally framed, and pictures are accepted of any size, so that no member may plead that the smallness of his apparatus prevents him competing. There is one point, but I scarcely think it has anything to do in influencing the result; it is that of the secrecy with which the exhibits are supposed to be surrounded, suppressing the names of the producers, &c. It seems almost impossible to preserve a strict incognito for the works exhibited. Nor does it matter in *this* particular instance, as the only advantage such secrecy effects is to procure an unbiassed judgment on the respective pictures. We have been very fortunate in procuring the assistance in this matter of three perfectly independent gentlemen of good standing in the art world, who have none of them, I believe, seen under any conditions any of the exhibits or replicas of any now submitted to their judgment; nor is the work of the photographers here competing familiar to them, even by being visitors to exhibitions, where an opportunity would have been afforded of seeing them; so that to whatever pictures may be awarded the palm for excellence, it will be by the decision of absolutely unbiassed opinions. In future it may not always be possible to obtain gentlemen without any previous acquaintance with the works submitted to their criticism; and as I think a certain amount of secrecy should be exercised, so far as not to publicly exhibit pictures or replicas of them in other competitive exhibitions that are intended for this, absolute secrecy is well nigh impossible. As an illustration of this, I have been mentioned as a duplex exhibitor of this kind, but in error; it is not so; the picture alluded to was a print from an entirely different negative, and taken from a different point of view; but the strong family likeness of pictures taken of the same subject will generally point out the author. It is only by a happy coincidence that the judges had no prior knowledge of the photographs they have had to pass their opinion upon, therefore, as I have just hinted, it may, perhaps, be as well in the future to exercise rather more discretion in the matter, and disqualify such pictures as are made familiar to the public before the termination of the competition here. Another thought occurs to me (providing the funds will permit): to institute a prize, equivalent to the challenge-shield in rifle competitions, that shall only remain in the hands of the winner for one year, unless he can carry it off in three succeeding yearly competitions; and, perhaps, the following modification in carrying out this scheme might be introduced with advantage, and that is, the words or titles for the whole twelve months should be announced at one time, a list of which should be hung up for inspection at each subsequent meeting, and members left their own time for working out their own ideas. The pictures should be delivered all together, before the first meeting of the session, after the expiration of the twelve months; but that it should be quite optional with the producer to deliver them monthly if he feel so disposed, the awards to be managed precisely in the same manner as now. Owing to the excessive climatic difficulties to which photographers in large towns have to submit, this extension of time, I am inclined to think, might be of benefit, and permit of some little laxity or modification in our present rules being adopted with advantage. This is, of course, a matter for discussion, as various opinions are held respecting it. Our first year, as you are all aware, was an experimental one; and it rarely happens that rules can be codified at once, that will not, after being thoroughly tested, bear some little alteration. This, I venture to think, may perhaps be one of them. However, we have given the scheme a year of trial, and the results are placed before you to-night, and it remains entirely in your hands to make it that great success in the future, that I feel convinced, if it have the hearty co-operation of those interested, it must eventually become.

P.S.—Since this paper was written, some of the suggestions here made have been discussed in Committee, the details of which our President will, no doubt, make known at the time he announces the names of the prize-winners.

Correspondence.

MOONLIGHT PHOTOGRAPHY AND THE ELECTRIC LIGHT.

Dear Sir,—I have sent you four prints from a negative taken by moonlight by myself, on June 22nd, 1880. They represent a portion of Ramsgate Harbour. The negative is a double one, size $6\frac{1}{2}$ by $4\frac{3}{4}$, exposed for carte size, with a repeating camera; the time of exposure of one was three minutes and a-half, the other two minutes and a-half; one of my gelatine plates was employed of only ordinary rapidity. The horizon, which is four miles distant, is very distinct; the drift of the tide is also well defined in the mouth of the Harbour, as is also a little cloud in the sky. The oil lights in the lanterns on each side of the watch are likewise very distinct. In the photograph, where the moon is a large circular blur, the atmosphere was slightly hazy; in the other, where the moonlight is cruciform, the atmosphere was perfectly clear. About two years since I sent the late G. W. Simpson several negatives that were enlarged by moonlight to double the diameter of the originals; these were by wet collodion, and were produced in half-an-hour.

It appears to me that the great drawback to the more general introduction of the electric light is the great cost of the electric generator, the motive power, and the regulator. If all the above machines be procured at a much lower price the electric light would possibly be more used for photography than it is at present; or, better still, if the current could be supplied from a works erected for the generating and distributing of the same. Here, it is evident, lies a great difficulty.

I spent two years in the construction of several forms of electric generators when I resided at Ramsgate, and being very well acquainted with the use of the tools of an engineer's workshop, I succeeded in the end in producing a powerful machine capable of being used either by hand or steam power.

Thinking that there are many photographers who would like to try their hand in constructing such a machine, which can be done at a moderate cost, I will, Sir, with your permission, give the required instruction for the making of such a machine. Many could then try for themselves the use of the electric light for photographic purposes.

A. J. Jarman.

STUDIOS AND THE WEATHER.

Sir,—In your article on "Studios and the Weather" in the last number of the News, you refer to the pleasure and lack of worry that would ensue were the tiresome expanse of glass roof done away with. I have to inform you that I have worked most rapidly and successfully for a year past in a studio with an entire zinc roof, using high front and side light only, and shall be pleased to show to any gentleman who will bring me your card its construction and practical working, if they will call on me any morning at 10 o'clock.

A word as to fixing gelatine negatives. In a saturated solution of hyposulphite, dissolve as much powdered alum as it will take up by stirring it occasionally for 24 hours. Filter into a dipping bath for use. Result: great cleanliness, quick drying of the negative, and hardness of surface.

I have tried a modification of this bath for fixing prints, but the test of time of course is at present incomplete.

Old Amateur.

Proceedings of Societies.

Photographic Society of Great Britain.

The annual meeting of this Society was held on Tuesday, at 5a, Pall Mall East, Mr. J. Glaisher, F.R.S., in the chair. Messrs. W. E. Downey, J. Gorson, and F. C. Buchanan having been elected members of the Society, the voting papers for the election of officers for the ensuing year were opened, and the choice was found to have fallen upon the following :—

President—Mr. J. Glaisher.

Treasurer—Mr. J. Spiller.

Council—Messrs. V. Blanchard, W. Bolton, F. Bedford, H. B. Pritchard, W. England, and P. Mawdsley.

Capt. Abney then read the report of the Council, which showed that the Society was in a very satisfactory condition, the meetings having been well attended, and several important papers read. There had been a slight diminution of members owing to death and other causes, and the Council called upon the Society to endeavour to make good these losses by the introduction of new members.

Mr. Spiller proposed and Mr. S. Davis seconded the adoption of the report.

Mr. Spiller then submitted the financial statement. The balance at banker's was £211 11s. 11d. against £225 11s. 7d. at the same time last year. The subscriptions and entrance fees amounted to £254 6s., admission to exhibition and sale of catalogues to £141 4s., making, with sale of Journal and advertisements, a sum total of £712 5s. 9d. After paying all expenses there remained assets, including balance at bank, amounting to £311 1s. 11d.

Capt. Abney moved and Col. Wortley seconded the adoption of the balance sheet.

After votes of thanks had been passed to the President, Treasurer, Hon. Secretary, and to Captain Abney as Editor of the Journal,

Mr. Warnerke read an exhaustive paper on "Sensitometers." After mentioning that the subject had emanated from a suggestion made at the Photographic Club, which had appointed a commission to enquire into the matter, Mr. Warnerke described his method, which, as one of the members of the commission, he had devised, and which had been approved by the other members. Mr. Warnerke's sensitometer consisted in the use of layers of papers numbered 1 to 25. These layers were placed one over the other at graduated distances, and allowing each number to be seen, and a mould taken in Spence's metal. From this mould an impression was taken in gelatine, coloured in neutral black, by the Woodburytye process. This impression was exposed to a luminous surface of sulphide of calcium mixed with paraffin, and the amount of light passing through the various thicknesses of gelatine recorded the respective sensitiveness of the plates placed underneath. Mr. Warnerke contended that by this method absolute accuracy was obtained, and that it would obviate such unreliable expressions as "ten times as sensitive as a wet plate," and the like. In speaking of the sulphide of calcium, Mr. Warnerke said that he found, much to his surprise, that the point of saturation of light was unvarying—that is to say, the burning of an eighth of an inch of magnesium wire sufficed to sensitize it, and no more sensitiveness was obtained, however much wire was burnt. He, however, recommended one inch, for convenience sake. To secure a uniform light, it was better not to expose the sensitometer to the luminous surface directly the latter was illuminated, as there was a certain amount of unsteadiness, but after allowing the luminous plate to remain a minute the light was uniform in quantity, and the records thereby obtained more reliable. Mr. Warnerke also exhibited apparatus which he had designed for the purpose of his sensitometers.

Mr. J. Spiller wished to know whether the neutral black referred to by Mr. Warnerke was lamp black; if so, it should be remembered that this substance had great hygroscopic properties, and it was therefore difficult to find samples which were alike.

Col. Wortley pointed out that the dryness or dampness of the atmosphere affected the absorbing power of sulphide of calcium.

Mr. T. Bolas said, with reference to Mr. Warnerke's objection as to the difficulty of obtaining the standard candle, the same thing might be said of sulphide of calcium. He did not agree with Mr. Warnerke's statement that, no matter the temperature, the absorbtion of light by sulphide of calcium was always the same. There was also, he thought, a difficulty in discharging the light from the luminous surface. This took a much longer time than was imagined. He considered that the magnesium light itself would be just as useful as a luminous surface. The latter, unless the paraffin and sulphide of calcium were properly mixed, was apt to be uneven in the absorption of light. He thought that every detail should be explained by Mr. Warnerke before his method could be called a standard one.

Mr. Davis had made several experiments with the standard candle, and had not found it so unreliable as Mr. Warnerke had represented. The temperature at which the plate was developed should also be taken into consideration, as during the recent cold weather he had found a warm developer indicate a much greater degree of sensitiveness than a cold one.

Capt. Abney, after referring to some experiments with the standard candle detailed in a paper in the Philosophical Magazine, in which the writer contended that the variation was as much as fifty per cent., a deduction with which he (Captain Abney) disagreed, went on to say that his own experience gave the variation as amounting to ten per cent., and therefore he was in favour of Mr. Warnerke's method. With regard to lamp black, much depended upon the sample. He regretted Lieut. Darwin was not present, as he had recently read a paper on the duration of luminosity in Balmain's paint, and had given two minutes as the time necessary to wait before the light became stationary.

Mr. W. Bedford said that as one of the members of the commission he might remark that each one had prepared designs of their own, but that when they saw Mr. Warnerke's method they allowed it to be much superior. He did not think the standard candle was a reliable method in inexperienced hands.

Mr. Warnerke then replied to the various comments which had been made on his paper. He could not answer Mr. Spiller scientifically, because he had used a commercial sample of lamp-black, which, however, he believed could be had of a uniform quality to an unlimited extent. With regard to Col. Wortley's remark, if it applied to the moisture in the air affecting the light, and not to the luminous surface itself, he confessed that he had not taken that into consideration, nor, indeed, had Becquerel. As to the moisture affecting the sulphide of calcium itself, there was sufficient protection by the use of paraffin. He disagreed with Mr. Bolas as regarded the facility of obtaining the standard candle. The standard candle was not used on the Continent, and could not be obtained. In Paris use was made of the Carcel lamp. As to the temperature, he could only say that his experiments went to show that no matter what was the temperature, the result in the absorbing power of the sulphide of calcium was the same. He did not think there would be any difficulty in obtaining sulphide of calcium of a uniform quality. As to the extinction of luminosity referred to, he had never found its necessity. As long as the surface was saturated, no difference could be experienced. He was not inclined to favour the use of magnesium direct, because in the first place the light was too intense, and in the second it burnt with unsteadiness and considerable variation.

The President then proposed a vote of thanks to Mr. Warnerke, and referred to the value of the paper which had been read that evening.

The presentation of the Progress Medal to Mr. Willis was deferred, owing to the absence of that gentleman.

The President called attention to the fact that at the next two meetings the walls of the room would be bare, and he hoped that the members would send in photographs for exhibition.

The proceedings then terminated.

South London Photographic Society.

An ordinary meeting of the Society was held on Thursday, February 3rd, in the rooms of the Society of Arts, Adelphi, Rev. F. F. Statham (President) in the chair.

The minutes of the Annual together with those of the Lantern meeting having been read and confirmed, Mr. Sydney V. White was elected a member.

Mr. E. Dunmore then read a paper on "Our Artistic Competition" (page 67).

The Chairman, in the course of a few remarks, said that the awards made by the judges would be read, but as this was the first of the competition, great things would hardly be expected. Many members would be deterred from sending in, because they could not do great things. Now this was a mistake, as all ought to contribute, if however small a picture, and so add to the success of the competition.

The Secretary then read the awards made by the three judges (Messrs. Lionel C. Henley, Townby Green, and W. Ludovioc) as follows :—

The award for competition (subject, "Winter") to Mr. F. Hollyer; for "Desolate," to Mr. Adam Diston; for "An Election," to Mr. C. J. Eames; for "A Relic of the Past," Mr. Adam Diston; the majority of the other months being a walk over for Mr. Adam Diston, he being the only contributor. In all, thirty-one pictures were sent in for competition, the Silver Medal for the best picture of the year being awarded to Mr. F. Hollyer, for the same picture that had gained the award for the month, "A Winter's Day on the Thames."

A discussion then ensued relative to the mode of carrying on the competition, several proposals being made. Amongst them Mr. Adkins proposed that the subjects be given out for three months, the pictures to be sent in every three months, as one month was too short a time to get a picture up in.

Mr. H. G. Cocking called attention to the fact that members who could not attend the meetings had no means of knowing what subject was given out till a week after in the journals, thus lessening the time.

Mr. Dunmore proposed that the twelve subjects be given out for the year, and the pictures be sent in either monthly, or at the end of the year, as the competitors thought fit.

Mr. King thought if three subjects were given out—say, for landscape, figures, and still life—the competition would be greater, as a photographer working in either one of these styles might not find more than one or two subjects during the year that would suit his style.

Mr. A. Cowan called attention to the fact that in the competition for the general award, figure and landscape were judged together.

Mr. G. F. Williams thought the small amount of success, as he might say, was brought about by the want of publicity given to the movement; but after that evening, and the statements made as to the awards, he thought this year would be much better.

Mr. Foxlee thought if the year of competition could be ended so that the awards could be made and the pictures exhibited at the Technical Meeting, it would add to the publicity of the movement.

Mr. Pearsall proposed that the Committee ask the Parent Society to exhibit the "competition" at their Pall Mall Exhibition.

The President said, speaking of publicity, he might say he had received a letter from the Rev. H. J. Palmer, asking if some of the pictures could be sent to him for exhibition at the Liverpool Amateur Association. The Committee had given him instruction to write and say, that now the awards had been made they would be forwarded

After some further discussion it was decided that three subjects be given out, respectively or January, February, and March, the pictures to be sent in by the April meetings, the three subjects being, "An Important Secret;" "My "A Valentine;" Landscape with a Bridge."

A vote of thanks was then passed to the three artists who had kindly judged the pictures.

Mr. E. Dunmore then exhibited a photograph taken by moonlight; the details were well out with an exposure of a little over five hours, the plate being an 8½ by 6½.

Mr. Edwin Cocking (Vice-President) then took the chair, and the Rev. F. F. Statham read a paper on the "Value of Photography as a Critical Agent" (page 64).

Mr. E. Cocking said he was sure they would all pass a hearty vote of thanks to Mr. Statham for his paper; for him to find time to write them a paper amongst the multiplicity of his engagements was a great thing.

A vote of thanks having been passed, Mr. Statham resumed the chair.

Mr. Bolas proposed and Mr. E. Fowler seconded that Mr. Mr. H. Trueman Wood (Secretary of the Society of Arts) be elected an Honorary Member of the Society; this having been put and carried, the meeting adjourned.

Edinburgh Photographic Society.

The fourth Ordinary Meeting was held at 5, St. Andrew Square, on Wednesday, the 2nd inst., Mr. John Lessels (President) in the chair.

The minutes of last meeting having been read, approved, and signed, the following gentlemen were unanimously elected ordinary members :—Bruce A. Bremner, M.D., James H. Gardiner, James Valentine, William Russell, John Methven, David M'Lean, and Allan R. Drummond.

The first business of the evening was a paper entitled, "Gelatino-Bromide of Silver Emulsion," by George Dawson, M.A., Ph.D. (in our next). Previous to reading the paper, the Secretary intimated that he had received a note from Dr. Dawson expressing great regret at not being able to attend the meeting to read the paper in person. The paper was then read by Mr. J. P. Moffat.

Dr. Thompson said he had listened with great pleasure to Dr. Dawson's paper, but he felt somewhat astonished at the length of time the gelatine was kept so near the boiling point. It was usual, in preparing emulsions, he said, to boil with a small quantity of the gelatine for a short time only, because boiling decomposed the gelatine. Now Dr. Dawson appeared to put in all the gelatine at once, bringing it up to the boiling point, where he kept it for two or three hours. The usual mode of cooking emulsions, as first introduced by Mr. Bennett, was to heat the water from 100° to 120°, and keep it at that temperature for several days. He regretted Dr. Dawson's absence exceedingly, as he had no doubt he would have fully explained these points.

Mr. T. Pringle thought Dr. Dawson was experimenting in the right direction. He (Mr. Pringle) agreed with Dr. Thompson in thinking that Dr. Dawson kept the emulsion near the boiling point too long; he had always found about a third of the time mentioned sufficient to bring up the required sensitiveness. In regard to Dr. Dawson's method of adding ammonia to the silver, he thought it would be a great improvement, as it must necessarily increase the sensitiveness of the emulsion. He would be glad if anyone present could give him a reliable method of testing the rapidity of plates.

Mr. J. M. Turnbull remarked that the question of testing plates was occupying a great deal of attention at the present time. Mr. Warnerke, he said, proposed to utilise the properties of certain of the phosphorescent substances as a standard light to expose the plates to, but for his part he thought that nothing came up to the old standard candle; provided it was placed (say) at a distance of ten feet from the lens, and the plate exposed always for an exact period of time, anyone could have a very good idea of the relative sensitiveness of plates.

Mr. J. P. Moffat remarked that he did not think a standard light was of so much consequence to photographers as an actinometer to judge of the light when photographing, either in the studio or outside, as the light in this country was constantly changing.

Mr. W. T. Bashford observed that Dr. Dawson recommended glass beakers to be used in making emulsion. Now glass was very easily broken, and had also to be carefully excluded from the light while boiling. He used a common stone jar, which could be procured from any pottery (those made at Portobello especially). All that was required to exclude the light was a cork with a piece of brown paper on the top as a cover. No weight was required to make it sink, as its own weight was sufficient, and as it was fired inside, the chemicals could not act upon it; at least, such was his experience. He also noticed that Dr. Dawson remarked at the end of his paper that his first batch of emulsion would not set, a circumstance which he attributed to the water, but it might also arise from over-boiling. In regard to the sensitiveness of plates, he thought this entirely dependent on the mode of development. Mr. Lessels said it would be difficult to lay down any rule as to sensitiveness, as the same plates in one one man's hands would probably give different results in another's.

Mr. James Howie thought the paper just read a most valuable one. He had been preparing emulsion, but as yet could not get the different batches to work exactly alike, and he would be glad if any one could give him some further information on this point.

Mr. Moffat said, in reply, that if Mr. Howie would make up a large quantity of emulsion, mix it well together, and coat the plates all at one time, he would get tolerably even results.

Messrs. Neilson, Briolmen, and others also took part in this discussion.

Mr. Dobbie proposed a hearty vote of thanks to Dr. Dawson for sending such an interesting contribution to the Society's transactions. He was sure the Doctor would be delighted when he learned that his paper had led to a thoroughly practical and instructive discussion.

The second business of the evening was the exhibition o some dropping tubes for dry pyrogallol, shown by Mr. J. Jameson. After he had explained them (in our next), they were passed round the table, and admired for their ingenuity and usefulness.

A vote of thanks to Mr. Jameson and the Chairman terminated the proceedings.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting of this Society took place at the Museum, Queen's Road, on Wednesday, 2nd inst., at 7.30 p.m., Mr. Davey (Vice-President) in the chair.

The minutes of the previous meeting having been passed, Messrs. W. Tribe, Jun., and W. H. Boome, were elected ordinary members of the Association.

The Hon. Secretary then read a letter from a Mr. Bell, in Australia, offering to exchange some stereoscopic slides of views of part of Australia with any members of the Association disposed to do so.

It was decided that this letter be acknowledged, and that the writer be informed that the matter had been laid before the members, with whom it rested.

The Chairman then called upon Mr. H. A. Daniel to read a paper on the "Platinotype Process," kindly contributed by Mr. H. B. Berkeley (in our next), on the conclusion of which,

Mr. G. F. Powell asked if it were possible to in any way tone the prints.

Mr. H. A. H. Daniel believed not, but that Mr. Berkeley had informed him that, when accustomed to the process, the operator had much control during development in preventing too cold a tone, also that the rough paper gave much more vigorous pictures.

Mr. W. T. Stephen remarked that there seemed very little chance of accommodating one's development to an over-printed picture without getting granularity, and that this contrasted unfavourably with the silver process.

The Chairman said he thought it very probable that one would soon get used to it, but having to keep the developer heated seemed rather a troublesome affair.

Mr. Daniel replied to the first remark, that he thought almost everyone present would agree with him, that in the matter of over-printing, platinotype suffered no disadvantage, as any attempt at doctoring an over-printed silver print resulted generally in a very poor affair. As to the Chairman's remark, he thought it simply a matter of degree, as in cold weather it was always necessary to warm the toning-bath, and no person seemed to object to do so. Why should the warming of the oxalate developer be any drawback? It was the simplest thing in the world, with a Bunsen burner turned low, and a little spare developer by one's side, to keep adding during any slight evaporation. The speaker said that for portraits, buildings, many kinds of landscapes, copying, &c., he considered it most artistic; and that Mr. Berkeley's statement that no extra-good-quality negative was required for platinotype printing must do much to make it popular.

The Chairman said that the simplicity of the process, and rapidity with which the prints were finished, added to the valuable fact of their being permanent, made the process very fascinating, and he had no doubt many of the members would be found adopting it.

Rev. H. B. Hare said that for portraits he very much admired it; but was not quite sure he liked the tone for landscapes.

Mr. Daniel said that he had found Mr Berkeley's assertion, that it "grew upon me very much," quite true, and could quite understand that if a good landscape, printed in platinotype, was hung in one's sitting-room, it would soon take the place of a favourite. As showing that there must be something beautiful about it, painters who had seen prints by this process greatly admired them.

Mr. G. F. Powell asked if anyone who had seen a platinotype licence could say what the restriction against its being used for other than contact printing implied.

Mr. Brightman said he presumed it referred to enlargements.

Mr. Daniel said he would enquire, and inform the members at the next meeting. (Mr. Daniel having done so since the meeting, it appears that the Company reserve the right of printing by enlargement to themselves).

After reading the paper, Mr. Daniel developed a number of prints, and remarked that a greater testimony to the simplicity of the process could not exist, as it was the first lot of prints he had developed. Four very fine large portraits were also exhibited, which were from negatives by Mr. Valentine Blanchard, and intended for silver printing. These were greatly admired.

Mr. G. F. Powell exhibited a couple of prints on Morgan's gelatino-bromide-of-silver paper, upon which some little discussion ensued. The speaker said there was a piece of apparatus which he thought the Association should possess, viz., a stereoscope.

Mr. Daniel said he should prefer its being a graphoscope, as it would embrace both purposes, and Mr. Powell agreeing to this, Mr. Daniel seconded the proposition.

Mr. Brightman desired to propose that the Association possess an album; it should have had one long ago, but it had been overlooked.

Mr. Stephens seconded the proposition. Both resolutions were unanimously carried.

Mr. Stephens gave notice that at the March meeting he should propose that the hour of meeting be altered from 7.30 to 8 o'clock.

A hearty vote of thanks to Mr. Berkeley for his interesting and valuable paper closed the proceedings.

Dundee and East of Scotland Photographic Association.

The fifth ordinary meeting of this session was held in Lamb's Hotel on Thursday evening.

Apologies for absence were received from the President (Rev. H. Macnamara), Mr. Jackson (of Perth), and others.

Mr. J. Robertson (Vice-president) occupied the chair.

After the minutes had been confirmed, the following gentlemen were elected members, viz.:—Messrs. P. Bewick, J. H. Martin, and Mr. A. F. Mackenzie.

Mr. C. Johnson (Hon. Secretary) informed the members that Mr. J. C. Cox had kindly placed at the disposal of the members of the Association the use of the large school-room at the Camperdown Linen Works, Lochee, together with two powerful Gramme machines for the electric light, and had invited them to bring cameras and plates for a demonstration on the evening of the 23rd inst.

Mr. H. G. Fraser showed a number of beautiful transparencies by the sciopticon lantern. They afforded much pleasure.

Thanks were warmly voted to Messrs. Valentine and Fraser for the exhibition.

Mr. Ireland proposed a vote of thanks to the Vice-president, and the meeting closed.

The Photographic Society of France.

A meeting of the Society was held on the 7th ult., M. Peligot in the chair.

After having nominated M. Pector as librarian, and an appeal made to all the members requesting them to present to the library any books or pamphlets which they might possess in duplicate, M. Bordet proceeded to read the correspondence.

M. Konarzewski gave the formula of a gelatine and gun-cotton emulsion:—

Alcohol at 36°	50 c. c.
Glacial acetic acid...	50 c. c.
Gun-cotton	1 gr.

To this collodion 10 gr. of dry gelatine emulsion are added, and dissolved by aid of the water bath. The emulsion has a tendency to slip off the plate, but this is entirely obviated by employing a substratum of albumen and silicate of soda. M. Schlegel is in the habit of spreading his emulsion without washing, and, after exposure, immerses the plate in cold water for some time. He also gives a gelatine developer:—

Concentrated ammonia	50 c. c.
Bromide of ammonium in 50 c. c. of water	5 gr.
Solution composed of 10 gr. of chloride of lime and carbonate of potash respectively dissolved in 50 c. c. of water ...	50 c. c.

In using, take 200 c. c. of water, to which add half a gramme of pyrogallic acid, and 10 c. c. of the above mixture.

Dr. Eder has been able to obtain direct positives by means of gelatine plates which may be exposed, developed, and washed in the usual way, then treated with a solution of nitrate of mercury; after washing, and a short exposure to light, they are developed with oxalate of iron, and fixed.

M. Camille Koechlin recommends the use of naphtol for the preservation of albumen solutions.

M. **DAVANNE** announced that the conferences he was to hold at the Sorbonne had been postponed, but the first, on the application of photography to science, would take place on the 26th inst.

The **PRESIDENT** next read a letter from M. Davanne, desiring the Society to accept a copy of his report on the photographs and apparatus at the Universal Exhibition, 1878.

M. **CHEYSSON** presented, through M. Davanne, his manual of the processes for reproducing writings and drawings used in the Government Department of Ponts et Chausées, in which photography is of great importance for maps and plans.

M. **DAVANNE** gave an account of the subscriptions paid towards the creation of a statue of Nicéphore Niépce.

MM. **VIDAL**, **BARDY**, **ANDRA**, and **BORDET** successively reported on the efficacy of Dr. Vogel's emulsion, all agreeing in praise of its rapid drying property, but coming to different conclusions with regard to time of exposure in comparison with other emulsions.

M. **DAVANNE** had tested the keeping qualities of Messrs. Wratten and Wainwright's plates for a period of ten months, and found they continue to give satisfactory results.

M. **MARTIN FLAMMARION** presented the Society with a bracket for supporting a magnifying glass capable of attachment to the retouching desk.

M. **DAVANNE** offered, on behalf of Mdlle. Marguerite Relvas, a collection of very fine photographs.

M. **JONTE** exhibited a new camera of a very portable character, allowing the lens four double dark boxes, and focusing cloth, to be contained in small compass.

M. **PECTOR** reported an interesting meeting of the Alpine Club, in which the details of a tour round Mont Blanc were related, and illustrated by photographs by means of an oxy-hydrogen lamp.

The members of the jury to award the Gaillard prize for the best and simplest method of obtaining a sensitive film on an infrangible substance were next elected.

M. **JOLY** presented some gelatino-bromo-iodide negatives, with description of their preparation. He gives the following formulæ:—

Bromised Emulsion.

Gelatine (including two parts of isinglass)	9 parts
Nitrate of silver	9 ,,
Bromide of ammonium	6 ,,
Water	200 ,,

This is iodised with an emulsion of—

Gelatine	5 ,,
Nitrate of silver	4 ,,
Iodide of potassium	4½ ,,
Water	100 ,,

After a new tourist camera of M. Enjalbert's construction had been examined, M. O'Madden gave his method of recovering an image which had almost disappeared in an over-exposed negative. It consists in washing the negative carefully, and plunging into the ferrous oxalate developer.

M. **CHARDON** obtained similar reduction of intensity by using a three per cent. solution of perchloride of iron.

M. **VIDAL** exhibited the apparatus by which he made his first experiments with the view of constructing a selenium photometer.

The meeting then adjourned.

◆

Talk in the Studio.

SCIENCE AND ART AT BLACKHEATH.—On Tuesday, the Committee of the Science and Art Classes at Blackheath gave a *soiree*, which was numerously attended by the élite of the neighbourhood. An exhibition of photographs formed an important feature of the gathering. South Kensington sent down a very beautiful collection, while one room was devoted to the exhibition of photographs lent by local gentlemen. The most remarkable were some exquisite pictures of life in Japan, taken by native artists. It would be impossible to portray more realistically the sense of vitality shown in these last. Although in each picture the subjects were engaged in some daily pursuit, not one of them looked as if he were conscious of posing for his photograph. The sedan chair bearers were positively in the act of walking, and all the pictures were full of implied movement. All the Royal Academicians, and most of the celebrated modern English artists, were represented by paintings sent from the very valuable collection of Mr. Webster. The principal other contributors to this wonderful loan exhibition were Chevalier Norchi, Mr. Gibbons Riddle, Henry Hersec, W. S. Jay, E. Onslow Ford, Mr. C. D. Davies, Mr. Alderman Nottage, &c., &c.

NEWCASTLE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—The inaugural meeting will be held on the second Tuesday in March, when there will be a Lantern Exhibition.

◆

To Correspondents.

⁂ We regret to say that pressure on our columns again compels us to postpone Mr. Heighway's article on "Ferrotype," together with "In and Out" and "Topic," and several Society papers.

T. K (Tidbury).—Your portrait lens is not likely to be any the worse for the accident; merely varnish over the chipped portions with black varnish.

E. **HANCOCK**.—1. A mere inspection of the print does not enable us to tell you what toning bath was used, but you will find it easy to obtain the kind of tone you wish for with the following bath:—

Chloride of gold	2 grains
Bicarbonate of soda	24 ,,
Water	1 pint

2. No. 3. Print until the ground is very slightly tinted, and leave in the above mentioned toning bath till the print is a few shades bluer than you desire it to be ultimately.

A **SUBSCRIBER** (St. Heliers).—1. About £30. 2. No.

JOHN LEWIS.—It is not sold ready prepared for the purpose, but must be first converted into a lake. Probably an artists' colourman would prepare it for you.

NEMO. Your emulsion is sensitive and works cleanly; by immersion in a bath of spirit we were able to prevent the frilling. Add a little more alum, and give your plates a preliminary coating. The film lacks adherence to the glass. Are the glass plates quite clean to begin with?

W. M. **CROUCH**.—We regret we cannot insert another letter; we have already given you three times the space afforded our critic.

LAMP BLACK.—1. We are glad that you have been so successful in working the process, and we shall be pleased to receive a paper describing the modification which you have made in the originally described method. 2. It is very cheap, the wholesale price not exceeding twopence per lb.

IRON.—The markings are probably due to dirty glasses. Plates which have been used may generally be effectually cleansed by being soaked in a solution made as follows:—

Water	20 parts
Potassium bichromate	2 ,,
Sulphuric acid	4 ,,

W. X. Y.—Some samples of amber are, like yours, almost insoluble in chloroform. Fuse your amber at as low a temperature as possible in a porcelain capsule, and after this, powder it finely. This somewhat detracts from the hardness of the gum, but much increases its solubility

C. E. G.—1. Hot soda and scrubbing brush, followed by a rinse of dilute nitric acid. 2. Sea water will do for all but a few final washes; and you will not be injured by making an after use of the fresh water for toilet purposes. 3. If condensed in a clean vessel, it is simply ordinary distilled water; but it is not very suitable for washing gelatine negatives, unless it be hardened by a trace of Epsom salts, or some other magnesium or calcium salt. Soft or distilled water often causes frilling.

YOUNG AMATEUR.—The lenses you mention are about equally good, and you will be quite safe in purchasing either.

F. **HUDSON**.—We have not seen the pictures you refer to, but the method of production was described in the NEWS about the beginning of last year.

E. F.—Add half an ounce of kaolin to each pint; agitate well, and filter.

F. H. **KNIGHT**.—Admirable results can be produced by the apparatus you refer to, but you can only form an adequate idea of its adaptability to your own requirements by seeing it in practical use.

MANAGER.—1. Under the circumstances, it might be wiser to replace the pictures by fresh copies, although in strict law you are probably not liable. In such cases it is well to err on the side of liberality, especially when, as in the present instance, you can easily afford to do what your client suggests. 2. It is probable that addition of a moderate excess of ammonia to the bichromate bath will prevent all future trouble as regards the point you refer to. 3. Merely an old name for protosulphate of iron.

STUDENT.—Write to the Secretary of the Institute; the address is Gresham College, E.C.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1172.—*February* 18, 1881.

CONTENTS.

	PAGE
Analysis of Organic Bodies by Means of Photography	73
Making the Best of One's Camera and Lenses	74
The Ferrotype: How it is Made. By W. Heighway	74
Photography In and Out of the Studio	75
By-the-Bye	76
A Dropping Tube for Dry Pyrogallol. By James Jameson	77
Notes	78
Topics of the Day	79
The Platinotype Process. By Herbert B. Berkeley	80
Gelatino-Bromide of Silver Emulsions. By G. Dawson	81
French Correspondonce. By Leon Vidal	82
How to Recover the Silver in its Entirety from Waste Gelatino-Bromide of Silver Emulsion. By A. J. Jarman	83
Correspondence	84
Proceedings of Societies	84
To Correspondents	84

ANALYSIS OF ORGANIC BODIES BY MEANS OF PHOTOGRAPHY.

In our "Notes" of last week we mentioned that Captain Abney read a paper on spectrum photography in connection with organic chemistry, at the Royal Society, which would set chemists thinking in a new direction. Having had the benefit of listening to the explanation of the paper by Captain Abney, at the meeting of the Royal Society on the 10th instant, we will endeavour to give an outline of the points which were prominently brought forward.

In the first place, the paper was the joint work of Captain Abney and Colonel Festing, R.E., who, apparently, have been at work on the subject for the last year, and only felt justified in bringing the matter forward after they had arrived at the very definite conclusions to which they had come, though we believe we are right in saying that a portion of it might have been given publicity sooner. We will endeavour, from notes which we took, to treat the subject as it was treated at the meeting.

The authors had noted that Dr. Tyndall met with very remarkable results in the absorption of radiations in organic compounds, either in the state of vapour or as liquids, when he used a thermopile, and it appeared to them natural that what was to be found with a rough indicator such as the thermopile, should be shown more distinctly by photography in the ultra red region of the spectrum. This proved very fully to be the case. The instruments they used were of the ordinary type, a three-prism spectroscope and a photographic camera. In front of the slit of the collimator they placed various liquids in tubes, and made the beam of light from an electric light travel through them. By the method described by Capt. Abney in his Bakerian lecture, and which we have recently published, he photographed the absorption spectra of various bodies in the ultra red. Evidently the greatest care in all instrumental adjustments was required, and also perfect rigidity of the apparatus, for we understand that many months' work was rendered almost useless through difficulty in obtaining a proper focus of his lens (at which we are now surprised, when it is considered that it was the dark rays he had to focus), and also through the shake of his laboratory floor. Finally, however, all these difficulties were removed, and sharp and defined photographs were obtained, from which the authors made maps of the various phenomena observed.

We may mention that, amongst others, the following were spectroscoped:—Water in lengths varying from six inches to fourteen feet; hydrochloric acid, sulphuric acid, ammonia, nitric acid, chloroform, the iodides of the alcohol series, and the alcohols themselves, also benzine and aniline. These are only a few of the substances examined, there being about sixty in all. At the meeting, copies of the maps of these substances were thrown from transparencies on the screen, and very remarkable they were. It was evident that in all the alcohol series, for instance, certain bands, far below the red, appeared common to all, and any variation in the spectra of the different kinds showed themselves nearer to the red, and that the heavier the molecules were, the lower down in the scale the variations were to be looked for. What was astonishing, however, to us was the fact that the positions of these bands were distinctly traced to positions in which hydrogen lines existed. Now, in organic bodies the principal constituents are carbon and hydrogen, to which may be added oxygen or chlorine, iodine, &c., or nitrogen and oxygen. Thus alcohol has a formula $C_3 H_6 O$, and ethyl iodide $C_3 H_5 I$, and ethyl nitrate $C_3 H_5 NO_3$.

When examining ethyl iodide, the authors were astonished at finding that the absorptions were principally lines, and, where bands occurred, that the edges were sharply defined; and they also noted that the edges of the bands in the alcohols appeared to fall at the position of these lines. They therefore determined to find out what caused these lines to appear in the one case, to disappear partially in the other. They began by trying chloroform, which is composed of carbon, hydrogen, and chlorine, the first two being present as single atoms, for the formula is $CHCl_3$. The spectrum of this body they found to be made up entirely of lines: the simpler the constitution of the body, therefore, the simpler seemed to be the spectrum.

The next fluids they tried were hydrochloric acid, sulphuric acid, ammonia, and nitric acid, and here they found that in those bodies lines still appeared, all of which were coincident with lines in the chloroform spectrum. There, then, did not seem to be much doubt as to what the lines were due. They knew they were not due to oxygen, and now they discovered that they were found in various liquids in which the only common element was hydrogen. The lines, therefore, appear to be due to the motions of that element, though it is tied to some other constituents in the body. When chloride of carbon ($C\,Cl_4$) or sulphide of carbon (CS_2) was spectroscoped, nothing at all appeared, so the only conclusion that could be come to was that, in order for there to be any special absorptions, there must be hydrogen present in the liquid. The authors then traced the effect of the addition of oxygen, which only seemed to be that the rays between the hydrogen lines were more or less blotted out, and that this accounted for the difference to be observed in the spectrum of the iodide of ethyl and that of alcohol. At this stage of the discourse came, perhaps, the most important announcement as regards chemistry: that was, that by spectroscoping an unknown substance, a very fair guess could be made of its constitution, such as knowing whether it contained the principal constituents of alcohol, or benzene, or both.

When chemists endeavour to analyse a body, it often happens that the tests they apply may destroy the original body, and convert it into something else; but it now appears that they have a readier means of testing a liquid, viz., photographing its spectrum in the ultra red region. A curious application of this research followed. It was shown that some of the hydrogen lines found in water and chloroform and other bodies were also found in the solar spectrum.

Finding a line in the water spectrum and in the sun, at first blush, might be supposed to show that there was water in the sun, or, more probably, in our atmosphere; but, as pointed out by the authors, it would be just as right to assume that there was chloroform in the sun as water, since the same line was found in both. The problem, then, has yet to be solved as to what these solar lines are due. It seems ridiculous at first sight to suppose that a hydro-carbon can exist in the sun, but when we remember that not long ago it was proved that acetylene, which is a hydro-carbon, was found in the electric arc, the impossibility of such a combination being present in the cooler part of the sun's atmosphere is by no means sure.

The chemists who spoke at the meeting gave unqualified praise to the method, and looked for great things from it. It certainly will be a triumph to photography if a delicate means of organic analysis can be formed by its means, and the blessings of chemists should rest on the heads of those who have started the research. Whether they have an easy task before them in mastering the method we much doubt. Chemists, as a rule, are not photographers, and photographers are not, as a rule, chemists. It is a rare chance when the one is the other. Chemists, however, have gradually been forced to the study of photography, a noticeable instance of which is shown in the recent work of Professor Hartley. In his case, however, photography was practised by him before he applied it to chemical research, as we remember seeing pictures of his hung on the walls of our Exhibition many years ago. Photography can be learnt, but the trials of photography, when plates have to be prepared and developed in almost perfect darkness, will drive many to avoid what must require excessive care and endless practice.

We have only given a brief outline of the paper, which will, we believe, appear in the Philosophical Transactions a year hence, probably. In the meantime, it is to be hoped that Capt. Abney and Col. Festing will continue their work, and be in a position to work out, even more fully than they have already done, an easy method for the analysis of organic bodies by means of photography.

MAKING THE BEST OF ONE'S CAMERA AND LENSES.

The photographer who makes use of his apparatus just as it comes from the maker, and fails to carefully inspect all details, is almost always at a disadvantage in comparison with the careful man who always satisfies himself as to whether his lenses work to focus, or the adjustment of the camera is perfect. Now that the weather is brightening, and some faint gleams of sunshine have gladdened the heart of the photographer, our readers would do well to carefully overhaul their working plant, and see that all is ready for the sun when he fairly shows himself to his expectant worshippers.

That happy amateur photographer who only possesses one lens and one camera may test both, as regards focal adjustment, at a single operation. To do this, a number of printed cards are mounted behind and above one another like the risers of a staircase, so that on photographing this system each card is taken at a different distance from the lens. The middle card being now carefully focussed, a picture of the series is taken with the full aperture of the lens, and it is desirable that the portion of the plate covered by the test cards should not be more than one-fourth of the area which the lens is usually supposed to cover. If the image of that card which was focussed prove to be the sharpest of the series, either the adjustment of camera and lens is perfect, or the error of one compensates for the fault of the other. If, on the other hand, some other card gives the sharpest image, the position of the ground glass focussing screen must be altered in its mounting until that card which appears most sharply defined in the photographic picture is most distinct on the ground surface. We assume that there is only one slide belonging to the camera; but if there are more they should be compared with that employed in testing. To do this, a finely-ground plate of glass is placed in the position of the sensitized plate, and any suitable object is accurately focussed. Should this object no longer be in focus when other slides are made use of, the faulty slides must be altered until exact coincidence is established.

When several lenses are likely to be used on the same camera, the best method to adopt is to first establish perfect coincidence between the focussing screen and a piece of ground glass placed successively in the positions to be occupied by the sensitive plates; this being effected by alternately focussing on each, and making any required alteration. This having been done, each lens must be tested separately by focussing the central card of the stepped series, and observing which yields the most sharply-defined image on a sensitive plate. Note must then be taken as to what fraction of a turn of the camera pinion is required to bring that card which proves best defined in the negative into sharp focus on the ground glass. When the lens is used it will be necessary always to make an adjustment to the same extent after focussing, but in the contrary direction. Particulars of the required corrections may advantageously be scratched on the lens mounts.

Other points also require attention if the best possible result is to be obtained from any given apparatus. A series of screens so placed in the camera as to just shave the edges of the cone of rays formed by the lens conduces very much to purity of image and boldness of effect; while even with a lens of the rectilinear or symmetrical type, a hood on the front of the instrument is of advantage in many conditions of light. Very many failures, and mysterious flare markings, arise from a reflection of light from the edges of diaphragms, these being often denuded of their black pigment. In the case of a diaphragm of small aperture, it is of considerable importance that the edges of the hole should be so bevelled off as to present a mere knife-edge to the light, as when the full thickness of the sheet metal is left, the proportion of reflected light, even in the case of a well blacked diaphragm, presents a considerable proportion to the whole amount. It is often advisable, especially in the case of portrait lenses, to blacken the edges of each glass, and even to paint a narrow black border round each face. If now tubes of velvet are fitted into the lens mounts, between the combinations, so much the better. Such precautions as a thorough testing of camera, slides, and shutter as regard their power of fully excluding chance rays of light, should suggest themselves to every photographer; but many fail to do this, and the consequence is that their results are less certain than they would be if more care were taken as regards the examination of apparatus from time to time.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

III.—Collodion and Bath.

Most of the commercial samples of negative collodion will serve well for the ferrotype; except those in which the potassium salts are used, the film being then too transparent.

A collodion prepared with cadmium and ammonium gives a creamy, opaque film, which does not show every defect of the plate. The ammonium iodide is an unstable salt, liberating free iodine, but with the cadmium iodide, which is the most reliable of the iodides used in collodion, it makes an extremely useful collodion—rich, opaque, sensitive, and full of detail.

For the ferrotype it is very necessary to have a collodion which may be thoroughly relied on; and the formula given below supplies one which yields good results under most circumstances, and requires but slight modification under extremes of heat and cold.

Ammonium iodide...	35 grains
Cadmium iodide	25 ,,
Cadmium bromide...	20 ,,
Pyroxyline	60 to 80 ,,
Alcohol and ether	5 ounces each

In hot weather, when the solvents evaporate rapidly, and it becomes difficult to coat the plates, let the alcohol be in excess. The effect of alcohol is to give intensity to the image, but it makes the film rotten.

Excess of ether makes the film contractile, so that it splits in drying. It also reduces density; but is more rapid in working than when alcohol is in excess. These properties of the solvents must be borne in mind when any change of proportions is to be made, and the bromides or iodides added to reduce or favour density or detail as may be necessary under the circumstances. Therefore, as the collodion is found to incline to the production of too great density or over-fulness of detail, the balance may be restored by a slight variation in the proportion of bromide or iodide.

Methylated alcohol and ether should not be used, as after a time they contaminate the sensitizing solution.

The effect of bromide in the collodion is to give detail at the expense of density of the image; iodides produce dense images lacking in detail.

The iodides and bromides should be finely ground in a mortar, and a little alcohol added to make a stiff paste; add alcohol to dissolve as much of the salts as possible, and pour into a wide-mouthed bottle of sufficient capacity for the bulk of collodion to be prepared. Again add alcohol to the paste, stir with a pestle, and pour off the dissolved salts into the bottle, repeating the operation until all is dissolved. Add the ether a little at a time, shaking well on each addition; then, tearing it into small tufts, add the pyroxyline to the mixture. Shake the mixture occasionally to assist the solution, and when this is done, allow it to stand for a few hours. Decant into a clean bottle, and set aside to ripen.

Cadmium collodion may be preserved in a cool place for months; but should it lose its flowing properties, it may be mixed with some of recent preparation. Collodion should always be stored in a cool, dry place, or the ether is likely to decompose, and this in turn decomposes the pyroxyline.

Proper relation between collodion and sensitizing bath should be maintained. An acid collodion will not work harmoniously with an alkaline bath. The colour of the collodion should be of a pale orange, a dark brown colour denoting the liberation of free iodine, and tending to harshness in the resulting picture. A few grains of carbonate of soda will reduce the depth of colour, and improve the collodion.

Crapiness of the film denotes the presence of water in the collodion; probably from impure solvents. Add collodion prepared with absolute alcohol and ether, until the crape markings disappear.

The purity of the silver bath is of the greatest importance, its sensitiveness depending upon it. Distilled water, therefore, being free from impurities, naturally commends itself as the best for the purpose of dissolving the silver nitrate; though upon emergencies ordinary cistern water may, after some purification, be used. The bath may be used directly it is prepared—

Silver nitrate, recrystallized ...	1 ounce
Distilled water	10 ounces

Slightly acidified with nitric acid.

Dissolve the silver, and to half the solution add potassium iodide until a slight milkiness appears. First filter the clear uniodized solution, afterwards that in which the iodide has been dissolved. By reversing this order, too much iodide will probably be dissolved, as the clear solution will take some of that left behind in the filter. Into a little water pour one or two drops of nitric acid, and carefully add this solution by drops to the silver. Shake well, and test on each addition with litmus paper, the faintest change from blue to red denoting the proper acidity. If too much be added, it may be corrected by addition of diluted liquor ammoniæ. Care should, however, be exercised to avoid the necessity for this. Undiluted acid or ammonia should not, under any circumstances, be added.

If ordinary cistern water be used, proceed as already directed, but, instead of acidifying at once, make the solution slightly alkaline by adding diluted liquor ammoniæ, and place the solution—in a clear white bottle—in strong daylight for a few hours. A dark precipitate will be thrown down. Decant the clear liquid, filter, and acidify, as already directed.

With ordinary care, the bath, strengthened from time to time as required from a sixty-grain stock silver solution, will last a long time without requiring any further attention than that of occasional filtration. After a time, pinholes may appear. To get rid of them, filter the bath, and add it to one of silver and water only. If so much silver is not available, or additional solution not required, pour the over-iodized bath into half its bulk of plain water, filter clear, make it alkaline by the addition of ammonia, pour into an evaporating dish, and boil down to its original bulk, then cool, filter clear, and acidify.

Plates from which the varnished surface has been worn by use had better be discarded, as their influence on the sensitizing solution must be injurious. Nor should plates be left longer in the bath than is absolutely necessary.

When fog sets in, the bath requires more thorough treatment.

Fusing the Bath.—Pour the solution into an evaporating dish over a stove, evaporate to dryness, and fuse until all the frothiness has subsided. Allow the metallic silver to cool. Add nitric acid, and, again applying heat, dissolve the mass; make addition of water, and again evaporate to dryness. It is now fit for use, and may be made up as at first.

Filtration of the bath each day, or every other day, and its maintenance at a proper strength, are means whereby a bath may be kept in order a surprisingly long time. Every time the solution is removed from the bath-holder, that utensil should be thoroughly cleansed. The dipper should not be allowed to touch any contaminating substance, and ought to be frequently washed. The bath-holder should be fitted with a cover of wood or American oil-cloth, and this always placed over it when the bath is out of use.

(*To be continued.*)

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Ammonia in Emulsion—Electric Light on the Continent—Gelatino-Bromide of Silver in the Printing Process—Collodion versus Gelatine—Vienna Photographic Exhibition—Anthrakotype.

Ammonia in Emulsion.—We referred to this matter in a recent leader, and regarding this question Dr. Vogel writes the following:—"It is beyond any doubt that ammonia increases the sensitiveness of emulsion, provided it is kept in contact with the latter for about one hour at a low temperature of not more than 90° F.; but it is also doubtless that it may cause fog under certain conditions, as gelatine is a very variable compound. My conviction is, that only those gelatine sheets which are made from the same solution, and dried under the same conditions, are of the same quality; and it happens very often that in the same parcel of a pound weight several qualities are mixed together. Gelatine sheets of different qualities, some made from material perhaps a little rotten, some dried quickly and others slowly, the latter being probably a little decomposed, may occur in the same package. In general the products of this decomposition of gelatine possess a reducing action; and if any perceptible traces of such matter are present, they will cause fog when ammonia is present. With such gelatine ammonia cannot be beneficial, as I have occasionally had a gelatine which, *per se*, gave a good emulsion, but fogged after the ammonia treatment. Such gelatine it is easy to recognize. Dissolve one grain of nitrate of silver in eight grammes of water, and add ammonia till the precipitate arising at first is redissolved. Next dissolve one gramme of gelatine in about ten grammes of hot water, and mix it with equal parts of the ammonia silver solution. If the gelatine is decomposed very soon after—say eight or ten minutes—a reduction commences, and the fluid begins to become yellow or light brown. Such gelatine is useless for the ammonia process, though it may be used without ammonia with the most satisfactory results. Should the gelatine contain a trace of oxide of iron, mixture with ammonia and silver nitrate causes a slight yellow tint, even if no reducing substance is present. The difference in the quality of gelatine is often so great that, in spite of the same formulæ and the same treatment, different sheets of gelatine out of the same parcel give sometimes very different results."

Electric Light on the Continent.—As we are informed from Berlin, a new electro-photographic portrait studio has been opened by M. Rousselon during the last fortnight. The studio is established in an elegantly-furnished room, the dynamo-machine being of Seimen's form, and it is actuated by a gas engine of four-horse power. The intensity is 2,000 candles. The arrangement is a little different from that of Vander Weyde's, the light being on an iron stand, which can be rolled on the floor of the studio, and may be therefore placed at the side of the sitter. A metallic parabolic mirror reflects the rays of the electric light on a paper screen of two meters diameter, and illuminates it very brightly. The other arrangements are similar to Vander Weyde's. The time of exposure for a gelatine plate is about ten seconds.

Gelatino-Bromide of Silver in the Printing Process.—Some months ago we expressed the opinion that it would be possible to get a highly sensitive paper for the printing process by coating paper with gelatine emulsion in the same way as carbon tissue is made. There is certainly no difficulty at all in the matter, and therefore we are not surprised to hear that the process is worked out by a French company. Our *confrère*, M. Vidal, has described the matter in detail. The emulsion paper is exposed behind a negative to the light of seven gas jets for about six seconds, and when the printing is finished, development is carried on in a particular bath.

Collodion versus Gelatine.—The question of the relative sensitiveness of collodion wet plates and gelatine emulsion plates is the matter of discussion now in Continental papers. Captain Abney asserts that he has prepared plates more than ten times as sensitive as a wet one. Dr. Vogel, on the other side, confirms the opinion of practical photographers, that the sensitiveness of gelatine plates is in the most favourable conditions not more than four times as much as that of a wet plate. The Editor of the *Mittheilungen* objects, against Capt. Abney's statements, that the latter has measured the sensitiveness of his plates in gaslight. This light differs from daylight in the quantity of indigo and violet rays; it certainly contains both, but relatively a little more of blue rays. Now it is well-known that wet plates are the most sensitive for indigo rays (wave length 430), gelatine plates the most for blue rays (wave lengths 450). For this reason, if gaslight be employed for comparative experiments, the gelatine plates are exposed under far more favourable conditions than wet plates, and that for the reason that the sensitiveness of the latter when estimated in this way appears too small. The results will be quite different if daylight is employed. It may be mentioned here, that Warnerke's sensitometer, a very valuable instrument, is too transparent for daylight experiments; for this purpose, another scale made from layers of thick paper, or some dense material, is to be preferred.

The Vienna Photographic Exhibition.—We are informed that the Vienna Exhibition, the opening of which was advertised for the 25th of last month, is not finished, and will, perhaps, not be opened before the middle of next month.

Anthrakotype.—Under this name, Captain Pizzighelli, in Vienna, publishes a valuable process for reproducing, by direct printing, such subjects as drawings, engravings, &c. The process gives—like the aniline printing process—a positive picture from a positive; it depends on the same principle as the (so-called) dusting process. Paper is coated with gelatine, sensitized in a chromate bath, dried, and exposed behind the drawing to be copied, immersed in water a short time, is blotted off, and dusted with any fine powdered pigment, washed again, and rubbed with a soft sponge for removing the superfluous colour. In this way, pictures in any colour can be produced—plumbago, ultramarine blue and green, sepia, cinnabar, gold and silver, bronze, &c. This is certainly an advantage, but it seems to us that the process is more complicated than Willis's aniline-printing process, which gives excellent results in experienced hands. Some further details of this interesting process appeared in a leader which is to be found on p. 13 of the present volume.

By-the-Bye.

ABOUT MEDALS.

We are not going to discuss whether the giving of medals at all, is a wise proceeding, nor do we propose to enter into the subject of the best method of awarding medals. We simply mean to have a chat about them as they exist, and perhaps air a few of the minor points that have attracted attention in connection with recent awards.

From the nature of things, where there are few prizes and many blanks, the number of disapprovals must always be very large; if a jury awarded five medals among one hundred competitors, and then asked the hundred to confirm by show of hands this award, there would possibly be ninety noes against it. The dissatisfied, none of them expected a medal, they would have you know; what they object to is the circumstance that the awards made have all fallen to the wrong people, just those, of all others, whose work is open to serious criticism. In the case of the Paris Salon, which answers to our Royal Academy, the dissatisfaction has reached such a high pitch in respect to awards, that Government has refused this year to have aught to do with the nomination of a direction; the people are to do it for themselves. And what has been the result? That a jury, or body of direction, has been chosen upon a political basis, artists of Bonapartist proclivities being excluded, and Republicans freely admitted; art has had nothing to do with the selection; it has been a step out of the frying-pan into the fire.

So long as people strive after perfection, whether it is an ideal jury they are looking for, or an ideal government, so long is discontent likely to last. "Man is not perfect," says the philosopher; "nor," he adds, "women either;" but, perhaps, of all imperfect bodies in this world, a jury has most shortcomings. A man of average intellect can walk about among his fellow-beings and be tolerably respected; but let him once be empannelled as a juryman to decide this point or that, and he becomes the object of general execration. In a Court of Law he is fined, bullied, and cruelly penned-in with his fellow-creatures, without regard to health or comfort; the judge is impatient with him, the counsel abuse him, and the public, after his verdict has been given, comment freely upon his stupidity and wooden-headedness. Juries that have other but legal questions to decide may be treated with a little more consideration, but that they always get heartily abused for their pains is but a matter of course.

We should be the last to affirm that on many occasions the strictures are only too well deserved. Juries are human, and it is human to err. The question to be considered, however, is, rather, whether, so long as verdicts are to be given in this way, either in photography or anything else, we can expect a better system to prevail. But, say some, we do not so much cavil at the verdict as the choice of men who deliver that verdict. They are the wrong persons altogether for art-critics, and hence their decision is a bad one.

Without going into the constitution of the juries at the London Exhibition, Cornwall, Bristol, or elsewhere, we will glance for a moment at the critics chosen by the great London organs—the daily press—the critics chosen by the most influential journals of the most influential city in the world. In London, we not only find the best talent, but we find, too, the best market for that talent, and hence we may well accept the choice made by our wealthy daily papers to be worthy of consideration. If, then, we look round at these art critics, we shall find that they do not include among their number a single painter or professional draughtsman; so that our editors and the public generally do not believe that a painter or sculptor is the best judge of paintings and sculpture. The *Times* for many years was represented by the late Mr. Tom Taylor, a practised playwright, a sound writer, and for some years previous to his death, editor of *Punch*. Mr. Tom Taylor wrote the criticisms upon the Photographic Exhibition which appeared in the *Times* between the years 1868 and 1878. The *Daily Telegraph's* staff of art critics consists of Mr. George Augustus Sala and Mr. Godfrey Turner, both able leader writers and accomplished journalists, but neither known to fame as painters of pictures. One or other of these gentlemen has usually written the notices of our Exhibitions. On the *Daily News*, the best known art critic of recent years is Mr. William Black, the Scotch novelist, and author of the "Princess of Thule," and many other charming stories. Mr. Black did not, during his engagement, hesitate to write the review of the Pall Mall Exhibition, but he is neither painter nor photographer, although his hand is cunning enough with the pencil. The *Standard* was represented for many years by the late Mr. Merritt. The *Morning Post*, in its art department, is frequently represented by Mr. Ashby Sterry, author of the "Boudoir Ballads," and other graceful poems; while on the *Morning Advertiser* the criticisms of paintings and photographs devolved for some years on Mr. Horace Greene, a barrister and writer of note. Curiously enough, therefore, we find London art critics to consist of purely literary men, artists, probably, every one of them in their particular sphere, but none of them professional painters or sculptors.

Would it be satisfactory, we ask, to those who grumble at the present plan of constituting juries for awarding medals at photographic exhibitions, to choose only literary men for the post? We fear not; any more than it has proved satisfactory to place among the jury, painters of acknowledged reputation. We say again, a jury, whatever its constitution, must necessarily be imperfect, and if you will have medals, you must not grumble if their distribution is not made according to the most sublime justice.

Another point that has recently been raised is, that the jurors, whoever they are, should make a report justifying their awards. We need scarcely allude to the old saw that says, "give your judgment, but never your reasons; your judgment will probably be right, your reasons wrong;" but even if your reasons are right, it does not follow that you are able to express them. You may be a wise judge, but a bad logician. Again, though it is easy to criticise a picture adversely, the reverse is a hard task indeed; thus, in finding fault, you may agree to the presence of genius, of skill, and of knowledge of the subject; but the whole thing, you argue, is out of drawing, the sentiment has been misunderstood, and the composition lacks completeness as a whole. Thus it is easy to censure any artist, and the more faults you find, the higher will stand your reputation as an art critic. But the jury or the judge are asked to execute a much more difficult task in defending a picture; you ask them to vaunt its praiseworthy effects, to show how vastly superior it is in this and that respect to other fine pictures near it. You do not ask one of the jury to do this, but all of them, and want them to agree unanimously on the high merits that are pointed out. A collective report such as this would be simply impossible, or, if it were drawn up, it would represent but the single views of the writer, and could not fail to be received with entire dissatisfaction.

Under these circumstances, it may be asked, do medals mean anything beyond indicating its recipient to be a lucky fellow? Is he anything beyond the object of good fortune? We think so. No doubt luck has a good deal to do with the matter, but we may well believe that if it gains a prize, a picture, besides being a good picture, must have points about it entitling its producer to high commendation. And if we find, time after time, that this or that gentleman is fortunate enough to get medal after medal, then we may certainly put it down that something far more praiseworthy than good luck is at hand. But it is obvious to all, exhibition after exhibition, that pictures go unrewarded which are in every respect as good as those that have earned medals. When there are many deserving pictures and few medals, the distribution of these must necessarily be unsatisfactory. If the jury could say, we find twenty first-class exhibits, and therefore we would suggest the award of twenty medals, one difficulty might be obviated, but it would give rise to several others quite as hard to overcome.

Rather, we would say, regard the award of medals as a piece of machinery, necessarily defective, which all must put up with, as long as these emblems are made an important part of our exhibitions. They give rise to discussion and argument, and that is decidedly something, if these are free from bitterness and ill-feeling; but whatever may be the advantages of medals, there are, nevertheless, some excellent reasons why they might be dispensed with in photography, as they are in the case of our international exhibitions of painting and sculpture.

Next week the "At Home" will be "Dr. Huggins at Upper Tulse Hill." The following "By-the-Bye" will be "A Faded Carte."

A DROPPING TUBE FOR DRY PYROGALLOL

BY JAMES JAMESON.*

Ever since Major Russell published his excellent little treatise on the tannin process, somewhere about a fifth of a century ago, I have used my pyrogallic dissolved in alcohol—96 grains per ounce; 5 drops from a pneumatic dropping bottle contains about 1 grain of pyrogallic For cleanliness and always being ready to hand, I could not desire a better method, but somehow or another for gelatine plates, I am compelled, though reluctantly, as being the best in my hands, to keep the powder dry. The ways of using it dry are many—every one *the best*. We have some who empty the pyrogallic from the stock-bottle into the palm of the hand; then the more careful way of weighing out into small paper packets; some use a strip of glass, others again bring into use salt, mustard, and snuff spoons, &c.

---

* Read before the Edinburgh Photographic Association.

The dropping-tube I bring before you to-night is composed of a glass tube eight inches or nine inches long, of any diameter from one-fourth inch upwards; inside, a tight-fitting piston, a little longer than the tube, graduated after trial to show the number of grains; in using, withdraw the piston to the required number of grains you wish to use; keep a firm hold of the piston and tube with the one hand, squeeze it firmly down amongst the dry pyrogallic, and transfer it to your developing cup or measure by pushing down the piston.

Notes.

Our readers will be glad to hear that Mr. Swan has done better with his electric light than he did with his carbon printing patent. A company has been formed, which buys Mr. Swan's clever invention for a very handsome sum.

The International Exhibition at Vienna was opened on Saturday, the 12th inst., by the Archduke Rainer, the patron of the Society. The president, Dr. Hornig, in an inaugural address, spoke of the progress of photography, and its importance as a branch and aid of science; he hoped before long the State would found a professorship of photography.

The exhibitors number about one hundred—Germany, France, and Great Britain being represented. There were no lack of applicants, it seems, but the Committee exercised their right of exclusion somewhat freely, the principal object of the exhibition being to show the perfection to which the various branches of the art and its applications have been brought.

We saw an admirable use made of an under-exposed photograph the other day. It was on the cover of an official report, issued by the well-known gunmakers Messrs. Krupp, of Essen. Messrs. Krupp, as we informed our readers a little while ago, not only have a photographic studio attached to their famous gun foundry, but employ the art to such an extent that it pays to have photo-collotype presses, from which most excellent work is issued.

The picture to which we allude is a collotype print, and represents the interior of one of the huge factories at Essen. It was scarcely to be expected that the ill-lit, grimy workshop, with its monster machinery, would give a perfectly detailed picture, but such as it is, the photograph, printed in grey monotone, is upon the cover of a pamphlet relating to Krupp's Works. Upon the vaguely defined photograph there has been printed, in bold letter-press, the title, &c., of the little volume, so that the heavy black type contrasts with the grey photo-tint underneath. In the result, the photograph seems all the better for being ill-defined, since it does not withdraw the eye when reading the title, while it supplies sufficient detail to give quite a mysterious charm to the cover. We commend the clever idea to our readers of thus combining letter-press and photography. Seasonable wishes printed over a faulty picture would often cover a multitude of sins.

An electric International Exhibition, likely to be of interest to photographers, takes place in Paris this summer. All classes of electric illumination will be exhibited. Among other wonders, Dr. Siemens promises an electrical railway, to convey visitors from the Place de la Concorde to the Exhibition, similar to the one now under construction in Berlin.

Says the *Weekly Dispatch*, remarking upon the sagacity of prison authorities:—"It seems that a warder of any experience can form a tolerably correct opinion as to whether a prisoner has ever been in custody before, by the way in which he enters his cell, and how he conducts himself in arranging the 'furniture' contained in it; but it appears that they are enabled to form a still stronger opinion upon this subject by the manner in which he conducts himself when he is photographed. It seems that old offenders, who are aware that the object for which this is done is to procure evidence to prove former convictions, resort to all manner of expedients to prevent the operator from taking a correct likeness."

Further, we are informed of the knowing plan pursued by old offenders to avoid being correctly photographed. "The most effectual way to do this, it appears, is to keep constantly moving the eyes," when it is not without the greatest difficulty a correct likeness can be obtained.

No doubt the plan in question would be "most effectual' if it were habitually practised, but the official photographer is quite able to cope with difficulties of the sort when they arise, which is very seldom. We ourselves have inspected many hundreds of photographs of "habitual criminals" at Scotland Yard, and have, moreover, as our readers know, lately visited the photographic establishments in the two largest penal establishments of the metropolis, and the results of our enquiries and experience tend to show that sitters inside prison walls behave themselves, if anything, rather better than those at liberty.

Dr. Huggins has been examining the luminous spectrum of water in the camera. To the eye, the flame of hydrogen burning in air gives only a faint, continuous spectrum; but on the photographic plate a group of lines is obtained in the ultra-violet, a result likely to prove a valuable addition to our knowledge of absorption spectra.

In our next "At Home" we hope to tell our readers, in homely language, the story of Dr. Huggins' star photographs, the way they are obtained, and what they teach us. "How I wonder what you are!" is to be banished for ever from the nursery in the face of Dr. Huggins' interesting researches, which, as our readers remember, secured to their author last year a medal from the Royal Society. We believe ours will be the most unscientific account yet written of this scientific investigation.

When gelatine plates are used wet, Dr. Van Monckhoven recommends their development with iron, the developer being kept in constant agitation, and a camel's-hair brush moved to and fro over the surface of the plate. The film will then develop as quickly as a dry one, but the operations of fixing and washing occupy longer.

According to a communication to the *Chemical News*, photographers appear, of all persons in the world, most favourably situated for the manufacture of hair-dye. Although many of them may not be aware of the fact, they possess just the very ingredients necessary to its preparation in the highest perfection. Nitrate of silver solution alone gives a dull reddish-brown tint after a time, we are told, "particularly noticeable when the light falls obliquely;" but an "instantaneous dye" is obtained by treating the hair first with a solution of pyrogallic acid, made strongly acid with acetic acid, and, when nearly dry, using a solution of nitrate of silver with a little copper (sulphate) solution added. We are further informed that all shades of brown and black may be obtained by varying the strength of the pyrogallic acid. After this, we shall expect no more grey-headed photographers.

Topics of the Day.

PHOTOGRAPHY AS AN AID TO THE STUDY OF GEOLOGY.

BY J. VINCENT ELSDEN, B.SC. (LOND.), F.C.S.

Amateur photography is too often looked upon as an idle amusement by many who do not fully appreciate its application to other branches of knowledge. Without discussing the question whether an amusement which necessitates exercise in the open air, encourages an æsthetic taste, and requires no small amount of skilful manipulation, can justly be called idle, even when it has no other object in view, it will, perhaps, interest many to know how the value of photography is increased when it is used, not for the production of tasteful pictures only, but as an aid to the study of natural history.

Probably, there are few geologists who have not had occasion to regret either the loss of time in making sketches of interesting sections, or the inadequacy of the result to represent the whole of the desired effect. Unfortunately, it is not given to all men of science to be skilful draughtsmen; nor, if they were, could sufficient time be spared from their field work for the accurate delineation of even a few of the many features which nature has unveiled for their inspection.

The rapidity, ease, and accuracy of photography seem to point it out as a simple means of overcoming this difficulty; and the convenience and certainty of modern dry-plate processes remove all objections which could otherwise be raised against it. When pictures can be taken which will give every detail that can be seen, involving but a trifling loss of time in the field, surely this means may be used with advantage as a substitute for more tedious and less reliable sketches.

But it is not maintained that photography is only a convenient substitute for drawing; it has also special advantages which render it far superior to any other method of recording geological observations. Perhaps the chief of these is that it is absolutely true to nature; it pictures objects as they are, without that exaggerated effect so misleading in the majority of sketches. Sketches show only that to which attention is desired to be drawn: whether it be a fault, a contortion of strata, or an igneous dyke, a single glance is enough to reveal the whole object of the drawing. The consequence is that the student is disappointed, on first commencing field work, to find nature not so plain as the diagrams in his text-book; and it is only after some amount of practice that he learns to eliminate secondary details, and to concentrate his attention upon the particular features he may be studying.

In photography this is obviated. Prominence is given to nothing; and the eye has to search the picture for the required object as diligently as the field geologist searches the face of the cliff or the side of the cutting. Without disputing the fact that, in the beginning, phenomena should be explained by clear and easily-intelligible diagrams it can scarcely be denied that, as a preliminary to practical work, photographs from nature would be far more useful.

But an advantage, not much inferior to the above, possessed by photography, is its power of reducing—upon a scale which is rigorously correct—a large area to a space so small that the eye can contemplate the whole at once, without losing that detail which a survey from a distance necessitates. There are numerous instances in which structures are thus brought into view which in nature might easily escape notice. In this way contortions—of which the curves are so small that they are almost inappreciable in a small area—are frequently brought into notice, while the parallelism of systems of joints can be more readily detected, and their angles of intersection measured; and in many cases the angle of dip can be more accurately determined than by any other means. But not only are the grander features brought into prominence by this reduction, but the relations of minute details are also made more distinct. For instance, an alluvial gravel and a glacial gravel may appear in the natural section almost identical in structure; but a photograph would, in most cases, reveal a tendency to stratification in the former, with the general disposition of the longer axes of the pebbles in the planes of bedding, which would contrast strongly with the indiscriminate arrangement of the latter. Hence there is a special advantage in a photograph showing, on a reduced scale and at one glance, structures which the eye might easily fail to detect in nature.

We have next to consider the value of a photograph as a means of estimating the amount of change which may have taken place upon the surface of the earth. In many parts, denudation goes on so rapidly that the aspect of the country continually changes, even in short periods of time. Let us take, for example, the great and rapid changes effected by meteoric agencies in the soft Eocene cliffs of Hampshire, in the fertile alluvial deposits of Russia, or on the sandy slopes of Alabama, where huge ravines are formed with alarming speed, and the surface changes from day to day. Photography would, in such cases, form an easy and accurate means of estimating the amount of erosion in a given period.

Again, it happens continually that interesting sections are spoilt for geological purposes; quarries become deserted and overgrown with vegetation, and cliffs become hidden beneath masses of soil which every winter's frost brings down from above. Many of the most instructive sections in England have been completely destroyed in this manner. The value of a photograph in such cases as these, at a time when the section is in its best condition, would be inestimable, both as showing all that is now hidden by overgrowth or by superficial detritus, as well as recording the constant change, which the geological record continually undergoes. How great would have been the interest now of a photograph of old Vesuvius, before the formation of the new crater entirely altered the configuration of the mountain! Of no less value to the next generation would be a faithful delineation of many objects in nature which will then have ceased to exist.

Nor must we forget that science upon which is based the foundation of stratigraphical geology, viz., the study of fossils. In many cases it is of the utmost importance that fossils should be represented *in situ*, and the scientific value of photographs of all the more interesting fossils *in situ* would without doubt be very great. These would be still more advisable when we consider the great risk which some fossils incur of being broken during their extraction from the rock in which they are imbedded. In some cases it is almost impossible to extract them at all, and in other cases, where animal remains are disconnected, the relative position of the parts to one another, and to the bed in which they lie, must necessarily be lost on their removal. In a photograph, all these points would be preserved for future study. In many cases, again, fossil shells are found which are far too fragile for removal or transport. Large and valuable specimens have frequently been lost on this account, and both interesting and useful evidence destroyed, where a photograph would have ensured the preservation of a permanent record. Even when safely deposited in the cabinet, fossils which have withstood for countless periods the action of percolating water, in many cases crumble slowly away when dried or exposed to the oxidising action of the atmosphere. Every geological cabinet affords instances of the gradual decay of some of the best and rarest specimens. Seeing, then, the constant changes which take place in nature, no one can question the utility of photography as an aid to secure a more lasting record.

Of the advantages of photography in petrographical research it is not necessary to say much. The advantages of its application in all questions of microscopical investigations have long been recognised, both in the study of rock sections, as well as for the reproduction, on a large scale, of fossil diatoms, foraminifera, and other microscopic organisms. It may be noticed, however, that the introduction of extra sensitive plates will prove of great advantage in this respect, not only for the purpose of giving better detail, but also on account of the smaller amount of light required, doing away with the necessity of direct sun-light. Wet plates were very unsatisfactory in many cases, owing to their want of detail when coloured minerals were photographed. Thus, a crystal of hornblende, by the wet process, appeared only as a black mass; while, with a gelatino-bromide dry plate, it not only showed the outline of a twin crystal incorporated with it, but also the striæ upon its surface, and the black scales of mica overlying it.

Having now given some account of the general advantages of a knowledge of photography to the geologist, I hope in a future communication to describe some of the practical difficulties which may occur, together with the means of overcoming them.

The "Topic" next week will be "Retouching for Beginners," y bHenry Morgan.

THE PLATINOTYPE PROCESS.

BY HERBERT B. BERKELEY.*

A very usual error is the idea that a special class of negative is required for platinum printing. This is far from being the case; and it would be more correct to say that a special kind of silver chloride paper is required for the thin negatives now often met with, and which we know is commonly used to confer the brilliancy lacking in the negative.

A negative capable of being printed in a strong light upon ordinary albumenised paper is sufficiently intense to yield brilliant platinotypes. For a negative of this character the sensitive surface has been prepared, the model for guidance being a negative with full scale of gradation. Some subjects, however, are better depicted by means of a negative with a low scale of gradation, and these subjects (which generally come under the heading of "portraiture") are well rendered in platinotype; but to produce contrast in the print there must be corresponding contrast in the negative, to which the paper will do full justice.

There is no real difficulty in making negatives having all the requisite intensity. The key to obtaining this intensity is a slow development. An aid to its attainment is sulphite of soda in the developer. Gelatine negatives are now so usual that there is a tendency to take it for granted that these will be employed in the production of the prints. Besides, with wet collodion and the numerous dry processes intensity is obtained by well-known means.

Given the possession of brilliant negatives, all should be plain sailing; but some begin operations as though they considered that if the paper be not wet it must be dry! Forgetful of the calcium tube and its uses, they treat the paper as though the former were simply intended to shield it from the light. The fact is the tube is of little use without the calcium, and the drier this is the better it will act. With careful use the calcium should remain hard and fairly dry for several weeks, and for a very long time when the tube is not often opened and is kept in a dry room.

Ferric oxalate is a hygroscopic substance and non-crystallisable; a powerful dehydrant is, therefore, required to keep the air in the tube in a perfectly dry state. Every silver printer will be aware that paper used for printing must be preserved during that operation in the same state of dryness—or the reverse—otherwise cockling, or want of sharpness, will ensue; but while all this applies with equal force to the platinotype paper, other entirely distinct forces may come into operation. These somewhat occult forces are mainly chemical.

A print made upon paper so affected leads one to suppose that the sensitive coating has receded into the paper, so dull, mealy, and sunken-in is the appearance of the image, and to some extent this may account for the effect; but further examination—especially in aggravated cases—will speedily show that other causes have been in active operation. It may be here stated that, when any portion of the solarised paper becomes during or after printing of a dingy black, this is a sure sign that damp is exercising its influence, and greater care must be taken.*

It is rather difficult to say what are the reactions which ensue upon the admission of moisture to the paper; but we all know that moisture—even if only as a solvent—is an indispensable requisite to most of the chemical operations both of nature and of science. It is, therefore, not very surprising to find that moisture is not without an influence upon the keeping properties of the substance under discussion. We know that chlorised paper, sensitized upon a silver nitrate bath, unless kept perfectly dry, will soon discolour. This effect is due to a reducing action of the size of the paper upon the silver nitrate. In a somewhat similar manner, probably, the size acts upon the ferrous oxalate. A basic salt may be produced, either directly or indirectly, by the absorption of oxygen, leaving only a portion of the ferric oxalate unaltered to form the image on reduction by light; for the basic salt is no reducer of the platinous salt, and is, besides, insoluble. This would account for the poorness of the blacks. There is also a lowering of the purity of the whites. Again, the above theory points to the probable cause. The tint taken by the paper where not exposed to light hardly leads one to suppose the colouring substance to be metallic platinum, but more probably the insoluble basic iron salt. Not, however, until after the clearing of the paper, or the removal of the salts soluble in dilute acid, will the change brought about by the aid of damp be fully visible.

Besides robbing the coating of a portion of its power for forming an active reducing agent under the action of light, it is likely that the basic salt (granting its formation), being itself insoluble, would retard the solvent action of the potassic oxalate upon the ferrous oxalate intermingled with it. This action might help to account for the granular effect shown in the shadows, a very similar appearance being brought about by cold development, which is also a slow development. Owing to the liability of the coating to decompose in the presence of damp air, it is, therefore, not only necessary to keep the paper perfectly dry in a calcium tube, but much care also should be taken during and after printing in order to preserve it in a similar state. In dry weather, and when the light is good, it may be only necessary to dry the pads occasionally before placing them upon the back of the paper; but in damp weather, and when long exposures are required, vulcanised sheet rubber placed over the paper and under the pads is highly desirable. In this way the print may be kept in the frame for several days, if necessary, in order to complete the printing.

I would impress the advisability of using the bath of oxalate of potash fully hot, for then a finer deposit and a warmer tone are obtained. A cool bath gives more contrast when the print is taken from a thin negative; but in the case the tone and texture of the print will never be so fine as when a hot bath is used. Lay down that part of the print first which cannot well be overprinted, or in which most detail is required; now lower the print gradually and without stopping, avoiding all hurry. Then at once pick up the side most liable to be over-printed—say the sky, about the exposure of which there may be some uncertainty—and at a glance the state of affairs may be seen. Let the hand act with the eye; and remember that, though the development is over in a few seconds, still it is not entirely mechanical, unless you wish it to be so.

---

* Abstract of a paper read before the Bristol and West of England Amateur Photographic Association.

* This is only one of the signs that damp is present. Much damage may be done by damp, which will only make itself evident upon development.

When clearing the prints in the acid baths see that they leave the last acid bath in a colourless condition. If this be not the case, treat the prints with a fresh acid solution (one part to eighty parts, as before) previous to washing. There is much danger of forming an insoluble basic iron salt, as well as of causing a slight precipitation of the insoluble calcic ferric oxalate,[*] when the last traces of iron are in contact with plain water; hence the use of the final acid bath.

It will be understood, then, that it may be actually *seen* when the prints are properly "fixed" and, I may say, washed, for little but acid remains for the water to remove. Attention should, therefore, be concentrated upon the acid bath, which is proposed to be the final one; and when a distinct faint yellow tint is visible a fresh acid bath should be given, while the other bath may be used for the first or second bath of a later batch of prints. The permanency of the image is not affected by insufficient washing in the acid baths; but the purity of the whites cannot then be depended upon for any length of time.

Just as a good negative avails nothing in the absence of suitable printing, so a fine print may be completely ruined by a bad mount. Mechanical and chemical defects are not here alluded to, though I have dug out little pieces of rusty iron, as large as pins' heads, from inferior mounts. Such abominations are not to be tolerated for mounting paper of any description. There is much, however, left to skilled judgment and good taste in selecting mounts of suitable tints and shades. It will be found that gold and red lines, buff and creams and (is it necessary to add ?) *pinks*, do not set off the prints—indeed, vulgarises them. "Turner-grey" and blue-greys are liked by some persons of taste; but perhaps the best tints, and those least likely to offend the critical eye, are those of different depths of neutral grey and brownish grey.

He who glazes a platinotype commits an aesthetic sin; he would hardly stop short of varnishing an engraving, should the "happy thought" strike him! The plain paper surface is one of the greatest charms of the print, and to it is due much of the fine atmospheric effect which can be obtained. To the deep shadows, however, additional vigour may be given by the application to the mounted prints of a solution of wax, or, perhaps, safer, solid paraffine in benzole or in ether and alcohol. This is applied to the shadows by means of a pad of cotton-wool, avoiding the more tender half-tones. In this way additional vigour is obtained and atmosphere retained. The shadows should not lose their matt surface, but should only gain in depth and richness.[†]

GELATINO-BROMIDE OF SILVER EMULSIONS.

BY G. DAWSON, M.A., PH.D.[*]

This subject is as yet far from being exhausted, although Dr. Eder Captain Toth, Dr. Monckhoven, Captain Abney, and various other intelligent and communicative experimentalists have done much to advance progress and pave the road to uniform and complete success. My own feeble efforts have mainly run in the direction of testing some out of the most promising of the multitude of methods which have from time to time been published in the photographic journals or elswhere, my object being to select the fittest, both for simplicity and certainty of obtaining good results. I was not long in discovering the great merits of a slight modification of a process described by that eminent scientist and careful experimentalist, Dr. Eder. The main distingushing feature of this consists in treating the bromised gelatine with ammonio-nitrate instead of plain nitrate of silver.

Since I first began practising this plan, I have considerably modified with advantage, both the time and temperature of emulsification, so that the following remarks contain the latest outcome of my experience in this direction.

For a pint of emulsion, dissolve 380 grains bromide of potassium in 10 fluid ounces of distilled water. This should be done in a German beaker or other glass vessel which will bear heat without cracking. Avoid porcelain or glazed earthenware pots, else impurities from the interior of the sides will, after a time, find their way into the emulsion by the cracking of the glaze. Place in the bromised water 660 grains Nelson's photographic gelatine to soak for ten or fifteen minutes. Put this glass beaker or vessel, with its contents, in any convenient pot or pan containing water, which shou'd be gradually warmed up to from 100° to 150° Fah. till the gelatine is completely dissolved. To prevent the bottle from cracking or bumping by being in contact with the bottom of the heating pan, it should be laid on a piece of wood, having a sheet of lead attached to the lower side. This will prevent any accident from that cause. The warming may be effected by a gas flame, or, if that is not convenient, by a paraffin lamp. Whilst the gelatine is warming, dissolve 480 grains silver nitrate in 9 ounces distilled water. Add thereto strong liquor ammonia, drop by drop, till the precipitated oxide of silver is just redissolved. Warm this in the same vessel in which the beaker or bottle of gelatine is digesting; then add the silver gradually, and with constant stirring with a glass rod. Finally, rinse in the last of the silver with another ounce of distilled water. The temperature should now be raised to about 200°, or short of the boiling point, and kept there or thereabout for two or three hours longer, and gradually lowered to about 100°, or a heat not exceeding 120°. After eight or nine hours, the resulting emulsion will possess moderate sensitiveness, viz., about four or five times that of wet collodion, and if the digestion goes on altogether for twenty-four to thirty hours, an extremely high degree of sensitiveness is readily obtained. Of course, before being fit for use, it must be thoroughly freed from the excess of soluble bromide, and nitrate of potash, &c., the resultants of the decomposition. The plan I adopt for effecting this is, after allowing the emulsion to set firmly in a clean flat porcelain dish, to tear the gelatine into shreds with a clean ivory paper-knife; then place it in a paper filter in a glass funnel, pour over it clean tap-water, and repeat this five or six times. Finally, when all the superfluous water has run through, I drench it with a few ounces of good methylated alcohol. If not required for immediate use, the emulsion may be stored in convenient bottles for successive batches of plates. In my opinion it improves by being kept for two or three weeks, of course in a cool place. Perhaps some antiseptic, such as thymol or salicylic acid might be useful if the emulsion has to be kept for a long time before being used. This I have never tried, as I have not had occasion to keep it any longer than three weeks.

There are a few precautions to be taken which I may as well notice here. The character of the light admitted to the sensitive gelatine must of course be attended to. But I would specially call attention to the nature of the vessel in which the sensitive compound is digested. Glass is the only safe material to use. Glazed earthenware may do very well for two or three digestions, but as soon as the glaze begins to crack, as it infallibly will, by repeated heatings, the impurities from the inner walls will, after a time, begin to make themselves felt in spots and other abominations.

I have said nothing about chloride or iodide in the emulsion, for the reason that, after many comparative trials, I consider them both useless if not injurious complications. In my opinion bromide of silver alone is superior to anything else. Chloride is developable by the ordinary dry plate developers, but not in the same degree as the bromide; whilst light-impressed iodide of silver is not at all amenable to that sort of development. Iodide may serve somewhat of a useful purpose by lessening, to a slight extent, the evil effects of blurring or optical halation. On the other hand, we have the testimony of Colonel Wortley, that his gelatino-bromide plates, which contained a little iodide, would keep under the very trying circumstances of a voyage round the world. My own recent experiments, carried out in an artificial manner, point to the same conclusion. The deterioration that I have met with consists in not obtaining full printing density with one developing operation, either by alkaline pyrogallol or potassic ferrous oxalate, whilst at the same time the deepest shadows were far from being so clear as they ought to have been. I think this is a question well worthy of the learned members of this Society, who have time and inclination for careful experiment. It may possibly turn out that Colonel Wortley and myself have been mistaken in our views, although we were both working independently of each other, and by different modes of procedure.

Addendum.—Since the above was written I have been down within "a lang cry" of Auld Reekie doing a little gelatine work. My first batch of emulsion, by the above method, turned out (*Anglice*) groggy, or (*Scottice*) unco fow, that is, it would not or could not stand firm on its legs; in other words, it would not set. On testing the water I found that it contained a very large percentage of organic (vegetable) matter. Further enquiry brought to light the fact that this same water was drawn from a "moss pot" in the neighbourhood. Hard water, that is, water containing a little chloride or sulphate of lime, is the best adapted for washing the digested emulsion. This is the first time that my attention has been practically forced upon the subject, but now I shall make it a matter for further investigation.

---

[*] Calcic salts are present in nearly all potable waters.

[†] This plan is especially applicable to the "rough" paper, where the surface presents various angles to the rays of light. The surface is thus made to *absorb* the light.

[*] Abstract of a paper read before the Edinburgh Photographic Society.

FRENCH CORRESPONDENCE.

Meeting of the Photographic Society of France—Mechanical Printing of Engravings—Sensitive Paper by Messrs. Christian and Liebert—Telethermometer Combined with the Selenium Photometer—Laws of Photographic Copyright in Norway and Germany—Indelible Aniline Ink.

Meeting of the Photographic Society of France.—At the meeting of the Photographic Society of France, on the 4th of February last, no subject of very great interest presented itself. I notice shortly a few of the communications which struck me. M. Chardon exhibited some transparencies for the lantern which he obtained by the use of a collodion made with hydro-cellulose pyroxyline. This pyroxyline possesses the property of giving prints of very great transparency, which is one of the essential conditions of those intended for projection purposes. *Apropos* of a gelatine plate which had become detached in parts accidentally wetted, and in spite of the varnish, M. Chardon pointed out that raw collodion was one of the best means of preserving gelatine plates. No moisture can penetrate through the collodion, and as this substance adheres strongly to the gelatine, it becomes a complete protective. The members of the Society examined, with great interest, some filter papers manufactured by Bernard Thalandier, of Ambert, presented by M. Perrot de Chaumeux. Their peculiarity consists in a small circular piece of muslin at the centre of the paper, and incorporated with the pulp; this gives the centre, which is the weak part of the paper, much greater power of resistance, and prevents it from tearing or breaking under the weight of the liquid to be filtered. M. Guerry has adapted a pneumatic release to an instantaneous falling shutter. By this improvement, any disturbance caused by the motion of the shutter is avoided. M. Davanne mentioned that a solution of citric acid in water is an excellent method of destroying the red fog which is sometimes formed on gelatine plates developed by pyrogallic acid. M. Enjalbert, of Montpellier, exhibited a very portable apparatus for taking views of considerable size. The characteristics of this apparatus are not only its comparative lightness, but also the ingenious arrangements for slides specially intended to contain sensitive films on pellicle, or on paper, as well as for the movement given to the objective holder, by means of which it can be made to occupy all possible positions in front of the camera, instead of merely sliding up and down or from side to side. Instigated, probably, by the rage which at present exists both in England and France for taking positives by development, M. Stebbing thought it advisable to call the attention of the Society to a rapid method of printing on paper coated with gelatino-bromide of silver. He showed to the meeting how by this means prints could be taken in ten seconds with the light of an ordinary candle. Evidently it is possible by a rapid process of this kind, properly thought out and improved, to arrive at results surpassing all other means in rapidity of execution.

Mechanical Printing of Engravings.—I am informed that machines for printing engravings are now being worked in Paris by the firm of Godchaux. This constitutes a great improvement in the art of graphic reproductions, and I foresee its application to the printing of photo-engravings. Wiping off, inking, and pressing are all effected mechanically, so that it is possible to pull twenty-five prints in a minute. I have obtained permission to see these machines at work, and I shall not fail to inform my readers of the nature of the improvements which have been effected, and of the prospect which has been opened out for processes of printing photographic plates.

Sensitive Paper by MM. Christian and Liébert.—In speaking of the sensitive paper of MM. Christian and Liébert, I made use of a generic term which may lead to a wrong understanding of the facts of the case. I stated that this paper was coated with gelatino-bromide of silver, because I had observed the gelatine; but it may well be, as M. Liébert himself declares, that the sensitive composition contains other salts of silver, the iodide or the chloride, or both of these haloid salts, in addition to the bromide. Not being initiated into the mystery, I cannot, of course, say for certain how the paper is prepared, or what is the composition of the film with which it is coated; but I can well believe what M. Liébert himself states, that if only the ordinary film of gelatino-bromide was used, no good results would be arrived at. Developing with ferrous oxalate would give the prints a disagreeable dull grey tint; it must be, therefore, necessary to use binary or tertiary compounds of silver, so as to obtain a tone more in harmony with the photographic impressions of the day.

Telethermometer combined with the Selenium Photometer.—In the pursuit of my investigations on the employment of selenium for the purposes of photographic photometry, I hit upon the idea of completing the apparatus with an electric thermometer, by means of which there could be observed successively on the scale of the same galvanometer, either the degree of temperature, or the degree of light. As is well-known, heating the joints of two different metals—copper and iron, for instance, when soldered together—gives rise to an electrical current, which is proportional to the amount of heat employed. Now if we have two joints uniting the two extremities of an iron wire to those of a copper wire, one of these joints being within, and the other without the selenium element, there will be produced in the galvanometer a deviation of the needle from the zero-point. To bring the needle back again to zero, it will be necessary to heat the other joint sufficiently to produce equilibrium, and the difference of the height of the thermometer placed in the interior will indicate the exterior temperature. The same result would be arrived at if the joint were placed in the interior, with a fixed temperature. It is not without interest to make these comparisons in order to establish the correlation which exists between the action of heat and that of light alone, while the selenium photometer is being worked.

Laws of Photographic Copyright in Norway and Germany.—The questions of the right of property in photographic works, which has for some time occupied public attention in France, was seriously discussed at the time of the Congress of Artistic Copyright which was held in 1878, and the laws which rule in Norway and Germany on this head were quoted in opposition to the proposal to place photographic works on the same footing with works of art. These two laws give a protection to the copyright in photographs for five years only after the expiration of the year when the first copy was produced. The first article of the law of the 12th of May, 1877, Kingdom of Norway, lays down that "anyone who produced for his own benefit an original photographic image after nature, or the photographic reproduction of a work of art, of which the reproduction is free, has the exclusive right of copying it by photography, and of selling it." In the same way the first article of the German law maintains that "the right of reproducing wholly, or in part, by mechanical means, a work taken by photography, belongs exclusively to him who prepared the photographic edition." Thus, the two laws give but a feeble protection to the original photographic work against a photographic or mechanical copy, so that, no sooner has the photographer or the artist delivered to the public his photographic work, than he may see this work reproduced by engraving, or by lithography, or by some other means, without finding any shelter in a law which proscribes only mechanical copying. There is something in this which appears to me to be contrary to common sense, for it cannot be equitable to give so much licence to those who copy. Let us hope that we may be more successful in France, and that we may be able to obtain for photography the only legal right which it really ought to have, that is, to be placed on the same footing as the other graphic arts, no matter by what means they are realised. In the meantime we must endeavour to open the eyes of the blind, a task which is the more difficult, inasmuch as the blind are unwilling to see.

Indelible Aniline Ink.—M. Grossfier, a police magistrate, who occupies his leisure hours with chemical and photographical experiments, has discovered an aniline ink of a deep blue colour. This ink possesses the property of penetrating the pores of the paper with very great facility. It is, therefore, well adapted for printing purposes in the case of those impressions which are called *papyrographic*. But the most interesting quality of this ink is, that it cannot be washed out by water. In general, all aniline inks are soluble in water, and drawing or writing executed in them are consequently not durable. With M. Grossfier's ink the writing will be permanent, even after being plunged in water; but it must not be exposed for too long a time to the light, which rapidly fades all these kinds of colouring matter.

Leon Vidal.

HOW TO RECOVER THE SILVER IN ITS ENTIRETY FROM WASTE GELATINO-BROMIDE OF SILVER EMULSION.

BY A. J. JARMAN.

Every maker of gelatino-bromide of silver dry plates, whether he be in a large or small way of business, must have quantities of waste emulsion, more or less, according to the amount of work he has to do, and I believe I am not wrong in stating of every one who has had occasion to send his waste gelatino-bromide to be refined, whether it be in a solid or liquid condition, that the yield of silver is as nothing compared with the yield of almost any other kind of photographic silver waste. I know of an instance where a few gallons of gelatine emulsion were sent to a very eminent firm of refiners and reducers of silver waste, that contained between £8 and £9 worth of silver nitrate, and the only sum of money that was returned for it was *twenty-eight shillings*. It appears to me that the method of refining chloride and sulphide of silver is comparatively useless for the refining of bromide of silver; it may be that bromide of silver is very volatile at a certain temperature; in fact, volatilization seems to account for the great loss.

I will now describe a method that will well repay for the trouble and outlay for the entire recovery of the silver, even from only a small quantity of waste emulsion washings of dishes, funnels, &c., used in the coating of plates, &c. Place the waste emulsion, scrapings, washings, dirt, and all, if you please, into a large saucepan, or any suitable vessel for boiling in, and, when melted over a fire, and nearly boiling, add some caustic potash or soda; stir well (this addition is to prevent the setting of the gelatine); have ready in another vessel a strong solution of cyanide of potassium; when the gelatine solution is in a boiling state, pour it into a large earthen pan, wooden tub, or iron tank, *not galvanized*; now add the solution of cyanide of potassium, stirring with a piece of wood all the time. If the cyanide solution is strong enough, and there is enough of it, the creamy colour of the boiled emulsion will all disappear, and a dirty, muddy-looking liquid will be the result.

The chemical change which appears to take place is that the silver bromide becomes transformed into silver cyanide by uniting with a part of the potassium cyanide, while the remaining part of the potassium cyanide dissolves the silver cyanide, and potassium bromide and caustic potash remain in solution. I may add that the solution may be mixed cold as well as hot; but when hot, or warm, the action takes place much more rapidly.

The next thing required is, to fit up a pair of galvanic battery cells, the size of which should be proportionate to the quantity of liquid to decompose. A very good size is as follows:—Take two jam jars that will hold about seven or eight pounds; make a cylinder of zinc, about one-eighth of an inch thick, or No. 10 gauge, so that it will fit into the jar easily, and stand about one inch above the rim; place in the centre a porous cell, and in the porous cell a carbon rod. The zinc cylinder should be amalgamated with mercury, which may be done by dipping the cylinder in a solution of—

Sulphuric acid	1 part
Water...	8 parts

and rubbing mercury all over it, *inside* and *out*. Make up enough solution of sulphuric acid and water to fill up both the jars, when the porous cells are in, and put in the porous cells a mixture of—

Sulphuric acid	4 ounces
Water	20 ,,
Bichromate of potash	2 ,,

Or they may be filled up with strong nitric acid. Now connect a piece of No. 16 copper wire to the zinc of one cell to the carbon rod of the next porous cell, and carry a wire from the zinc of this cell to the tank or tub containing the cyanide solution, and also a wire from the carbon rod of the first cell to the tank also; now attach a piece of copper plate to the wire coming from the zinc, and a flat piece of gas carbon, or a lump of coke, to the wire coming from the carbon rod. The moment the coke and the copper plate are immersed in the liquid, the piece of copper will become covered with a white deposit of pure silver. The action should now be allowed to continue, from the beginning of the week to the end, only take care to have the sheet of copper large enough. It is best to weigh the copper first. Now, knowing its weight, you can take it out of the solution from day to day, and weigh it; you will then see how much silver there is deposited. When the solution becomes exhausted of silver, more of the waste bromide solution may be poured in, stirred up well, and the batteries set going again.

The cost by this method is the cost of the zinc and acids consumed, which is far less than the cost incurred by loss in the furnace, and the charge made for refining. When the silver is thick enough, it may be broken off the copper plate with a hammer, and the full value obtained for it. I may add that a solution formed by this method is nothing more than a silver plating solution. It is, perhaps, best to add two or three gallons of water when the two solutions are mixed, to thoroughly ensure the non-setting of the gelatine.

Theoretically, for 65½ ounces of zinc consumed in the battery, 108 ounces of silver should be deposited; but in practice, with great care, about 70 ounces of zinc will be consumed for every 108 ounces of silver deposited. Strange to say that, even if the solution should become set, through a superabundance of gelatine, the deposition of silver goes on nearly the same.

If anyone wishes to silver-plate their spoons and forks, and thus effect a saving, they can do so by first boiling the articles in soda solution, rinsing, scrubbing well with brick-dust and water, dipping them in a dilute solution of nitrate of mercury, and suspending them by the wire coming from the zinc of the battery; after a few hours' action, brush them up with a brass wire brush and water, and burnish and polish them in the usual way; such a coating of silver will be obtained that will resist the wear of years. The colour of the silver deposited is very white upon the copper sheet, and will be very adherent, providing the piece of copper is large enough; but if it is too small, the silver will be deposited as a fine powder of a brownish grey colour, easily brushed off the plate, which, however, should be saved, as it is easily melted with the more coherent variety. Hissing must not be allowed to take place with the zinc cylinder when the battery is in action; if it does, it must be again amalgamated with mercury. All the silver waste in the manufacture of the Archer plates is refined by the above method, and has well repaid the small outlay and trouble incurred. Hyposulphite of soda will answer in the place of cyanide of potassium for dissolving the waste bromide of silver, only a greater weight of it will be required.

Correspondence.

BLEACHING THE GELATINO-BROMIDE IMAGE.

Dear Sir,—I take the liberty of calling your attention, and that of the readers of the Photographic News, to the following experiment I made, which, as far as I can see, is a new method of bleaching negatives obtained on gelatine dry plates.

Place the negative in a tray containing a pretty strong solution of neutral chromate of potash in water, and allow it to remain for a minute or two. Then place it in another tray containing diluted hydrochloric acid, say one part of the acid in twenty parts of water.

The bleaching is effectuated almost immediately, with the beautiful result of apparently changing the negative image into a positive one. The plate is subsequently well washed.

Similar results may be obtained by using bichromate of potash instead of chromate, and the experiment may be simplified by adding a few drops of a strong solution of chromate of potash to the diluted acid. By using this solution instead of the two above mentioned, one operation only is necessary to operate the bleaching of the negative plate. I do not know, however, whether the changes are permanent.

I am induced to describe the above experiment by an excellent friend of mine, in the hope that it may lead to a better method of intensifying gelatine negatives.—I remain dear sir, your obedient servant, Eug. de Zuccato.

EMULSIFICATION IN DAYLIGHT.

Dear Sir,—I notice with interest your allusions, in the last issue of the News, to the action of bichromate of potash in bromide of silver emulsion.

I have experimented in the same direction myself, and I conclude that the use of bichromate does very greatly retard the activity of silver bromide.

I made some emulsion in the usual manner, boiling forty minutes; I next divided it, and (1) washed one half by precipitation in alcohol; the other half (2) I treated with sufficient eight grain-solution of bichromate of potash to well cover it, and left it standing about an hour, afterwards washing greater excess of bichromate out with water, and completing with alcohol.

On coating plates and testing, I found No. 1 good workable emulsion with a comparative rapidity of about ten times that of collodion wet plates, while No. 2 was only about equal in rapidity to the latter, and remarkably clear in the shadows.

The same possibility may exist in my experiment as in yours, Mr. Editor, that I did not sufficiently eliminate the bichromate; but I am very much inclined to think it is a purely chemical change by re-arrangement of some of the silver and bromine atoms. Yet, on the other hand, it appears strange that the strong affinity of bromine and oxide of silver can be affected by such a salt as bichromate of potash, which neither in its saline or basic state appears to have much sympathy for the above. Perhaps some of your correspondents can specify the actual change which does take place.

I purpose submitting some emulsion to varied stages of prolonged cooking, and then noting the result when treated with the bichromate solution.—Yours very truly,

Lyddell Saywer.

Proceedings of Societies.

Edinburgh Photographic Society.

The second popular meeting of the session of this Society was held in Queen Street Hall, on Wednesday, the 9th inst. The pictures shown by the lantern on this occasion were a number of instantaneous views which were the work of various members of the Society; also photographs from the pictures of several artists, giving the idea of motion.

A vote of thanks to the lecturer terminated the proceedings.

Photographic Society of Ireland.

A meeting was held on Friday, the 11th inst., at 8 p.m., in the Royal College of Science, Mr. J. V. Robinson in the chair.

The minutes of the preceding meeting having been read and confirmed,

Mr. George Mansfield read a paper on the Platinotype process, with practical demonstrations of the development of the prints.

A large collection, specimens of the process, which had been kindly lent by the Platinotype Company, were exhibited, and much admired.

Mr. Mansfield drew attention to a new developer for gelatine plates, the particulars of which he published last week, and he showed several negatives obtained by its use. It was claimed for this developer that the exposure was considerably shortened.

Professor Barrett brought before the meeting the recent improvements in photographic telegraphy, as published in *Nature*.

Mr. Joseph Woodworth exhibited a view taken by moonlight with an exposure of one hour and three-quarters.

A vote of thanks having been passed to Mr. Mansfield and Professor Barrett for their interesting communications, and to the Platinotype Company for the use of their collection of specimens, the meeting adjourned.

To Correspondents.

Sand-Boy.—1. You will find what you require in our Year-Book for 1881, but, in order to ensure success, a considerable amount of experience is generally requisite. 2. The apparatus in question possesses many points of excellence, although it might be perhaps going too far to call it "perfect." It certainly has not "quite superseded" the old arrangement. 3. We can only suggest a glance through the following—probably you can see them at the Patent Office Library:—"Papetier et Régleur," by Fontenelle and Poisson; and "Fabricant de Papiers," by Lenormand, both published by Roret, 12, Rue Hautfeuille, Paris.

Wm. Wallace.—1. It is probable that you will have to make them yourself. 2. The Durable Printers' Roller Company, Farringdon Street.

T. C.—1. Under-exposure. 2. Probably very hard water used in the preparation of the developer, or excess of ammonia. 3. One part to three or three-and-a-half of water. 4. We have never met with such plates, and therefore cannot say.

Black Spots.—1. It is probable that the varnish has broken away from the negatives at the points in question, this want of adhesion being perhaps due to damp places in the film. When the fixing salts have been imperfectly removed from a negative, this kind of thing is very likely to happen. 2. The sample of felt appears to be very good in quality.

Veritas.—1. Probably the varnish is unsuitable. Consult Mr. Heighway's articles, which are now appearing in the News. 2. It appears to be a case of the reversed action of light, and there are points in connection with this phenomenon which are not well understood at present.

A. Y.—1. India-rubber solution. 2. The kind of canvas on which Berlin wool-work is made.

Emulsion.—The exposed bromide of silver appears to be restored to its original condition by certain oxidising agents, among which may be mentioned potassium bichromate; this salt having been used with success by Captain Abney for undoing the work of light on gelatino-bromide plates.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1173.—*February* 25, 1881.

CONTENTS.

	PAGE
Preparation and Conservation of the Negative Bath	85
Use of Artificial Light, Especially that of Gas, for Printing	85
Reversal of the Photographic Image During Development with Ferrous Oxalate. By H. Wilmer	86
Lantern Matters. By W. J. Chadwick	86
At Home	87
Notes	89
Topics of the Day	90
The Ferrotype: How it is Made. By W. Heighway	91
On Sensitometers. By Leon Warnerke	92
The Etho-Oxygen Lime Light. By W. Broughton	94
Correspondence	95
Proceedings of Societies	96
Talk in the Studio	96
To Correspondents	96

PREPARATION AND CONSERVATION OF THE NEGATIVE BATH.

Notwithstanding the rapid progress which the gelatino-bromide process has made of late, the bath is still the backbone of photographic work, and its satisfactory management is a matter of more vital importance to the majority of our readers than are the exact conditions of perfect emulsification, or even the relative advantages of development by ferrous oxalate or by pyrogallic acid.

The first requisite in bath making is a supply of silver nitrate of suitable quality, and to obtain this salt in the highest perfection is by no means an easy matter. A man whose primary object is the production of the highest class of work with the nearest possible approach to absolute certainty, will not hesitate to prepare his own nitrate of silver, although this operation may consume so much of his time as to raise the cost of the article to near double that of the best commercial salt. As the manipulatory details incident to the preparation of nitrate of silver in a thoroughly satisfactory manner are by no means so simple as many imagine, we intend shortly to devote a special article to the matter, and, in the meantime, will assume that the pure salt is to hand; more than this, we will suppose that distilled water which is entirely free from any volatile or other form of organic matter, can also be obtained. In such a case, all that is necessary is to dissolve thirty grains of the silver salt per ounce of water, and to slightly iodize the solution by allowing a glass rod which has been dipped in collodion and nearly dried, to remain in the bottle of solution for about an hour.

Provided that the water and silver nitrate are pure, and the collodion used is free from deleterious substances, the bath thus obtained will neither require the addition of acid, nor doctoring of any kind, the negatives resulting from its use being beautifully clear, and free from every trace of chemical fog.

When, on the other hand, any of those mischief-working organic bath-poisons which lurk in carelessly-prepared silver nitrate, or which occasionally exist in those samples of the salt which have remained in contact with paper or cork, are present, it will be found that negatives produced with the bath in question will lack that extreme cleanliness and vigour which characterise the work of the photographer who studies the chemical purity of his bath. It must not be forgotten that organic bath-poisoning is liable to arise from greasy or oily impurities in the distilled water, especially when this has been obtained by condensing steam from an ordinary boiler.

Now let us suppose that it is impracticable to obtain silver nitrate and water in the highest state of purity, and that the bath, when tried, shows slight signs of the presence of organic poison. What, then, is the best course to follow? In the first place, the solution should be made slightly alkaline by means of sodium carbonate, one grain of this salt being usually quite sufficient for each ten ounces of solution. This having been done, the bath should be exposed to a bright light, the action being allowed to continue as long as may be practicable. Afterwards the solution must be very carefully filtered and slightly acidified with nitric acid, about two drops of this being required for each ten ounces of the liquid. The above treatment will usually restore a bath which has become organified by use, and, consequently, yields pictures marred by various and indescribable markings; only in such a case it is advisable to get rid of the alcohol and ether by boiling before proceeding to the alkaline treatment or the exposure to light.

It is a wise precaution to keep, in a well-lighted place, a large, clear glass bottle full of distilled water, care being taken that this water always contains a small quantity (say a grain to each ounce) of silver nitrate, and that an alkaline reaction is maintained by the addition of a little sodium carbonate. The water will, under these circumstances, be always ready for use in the preparation of new bath solutions; but it must be remembered that its alkalinity must generally be neutralized at the time of using, as an alkaline bath is a luxury which only the most careful among photographers can indulge in.

USE OF ARTIFICIAL LIGHT, ESPECIALLY THAT OF GAS, FOR PRINTING.

The use of artificial light for printing is already many years old. At first the electric light was exclusively used for this object; Mr. Woodbury having had recourse to this agent in the year 1866, as he then produced his gelatine reliefs, from which the metallic plates were pressed, by exposing films of chromated gelatine to the illumination of the electric light.

Dujardin, at Paris, also employs the electric light for acting on those plates of chromated gelatine which he uses in the production of photo-engraved and zincographic plates, and in his process the films of chromate under the negative are only exposed for between twenty and forty minutes.

Rodriguez makes an even more extended use of the electric light. He employs it for printing from negatives on sensitive paper, and the exposure of chromated gelatine surfaces, not only in the case of photo-lithographic and heliographic methods, but also in the case of methods involving the use of Judea bitumen.

Lately, gas, as an illuminating agent, is coming into use for photographic purposes, and the recently-invented powerful gas lamps give a very actinic light. Swan's experiments, in which he succeeded in producing by gas-light in a few seconds, on paper coated with gelatino-bromide, an image capable of being developed by iron oxalate, will be fresh in the recollection of our readers. Since Swan published his method last year several so-called "newly-invented methods for printing by gaslight" have cropped up, and are offered for sale as trade secrets.

As yet the employment of gas-light for printing on chromated gelatine has not been more closely investigated and for this reason, Mariot, at Vienna, undertook some experiments on the subject, in which he used the so-called Siemens' regenerative burner, this having an intensity of light equal to 400 normal candles. A gelatine paper sensitized with potassium bichromate (a photo-lithographic transfer paper) was exposed under a negative, and, after four hours' exposure, it gave, on inking, a sufficiently vigorous picture.

For printing on albumenized paper, gaslight is not sufficiently active for rapid working, it being necessary to expose for comparatively a long time; at least one and a-half to two hours being required in this case.

The fact that the light of gas acts relatively much more powerfully on chromated gelatine than on silver chloride paper depends, doubtless, on the different behaviour of these two substances in the spectrum. The chromium compounds are very sensitive to the indigo blue part of the spectrum, and the spectrum of gaslight is very rich in the rays of this colour. On the other hand, the albumen paper or silver chloride paper is most sensitive to the ultra-violet light, and very slightly to the blue, and it is just in those rays that gaslight is particularly wanting.

There is a secondary circumstance which ought to be mentioned. The intense gaslight develops much radiant heat, which acts injuriously on albumen or silver chloride paper. Under its influence the paper blackens very rapidly. Now, heat not only does not injure the chromated gelatine films, but it even promotes a more rapid action of light, and a greater hardening of the film.

We ought to point out that much more favourable results will probably be obtained with Wigham's gas-lamp, because this latter gives a light three times stronger than Siemens' lamp, and the time of exposure may therefore be greatly reduced.

REVERSAL OF THE PHOTOGRAPHIC IMAGE DURING DEVELOPMENT WITH FERROUS OXALATE.

BY H. WILMER.

A SHORT time ago, Captain Abney, in a paper read before the Photographic Society of Great Britain, called attention to the peculiar action of hyposulphite of soda when added to ferrous oxalate during development of a gelatino-bromide plate. He found that a gelatine plate containing iodide of silver so treated, developed much more rapidly, or, in other words, that the use of hyposulphite of soda admitted of a much shorter exposure. Captain Abney also stated that possibly the effect of adding hyposulphite when the plate contained bromide of silver alone, or bromide and chloride of silver, would be to cause a reversal of the image. Had I seen the latter before I made the experiments I am about to describe, probably I should have taken the fact for granted, and this communication would have remained unwritten. However, I made a note of the accelerating action of the hyposulphite, and forget about the rest. Some days ago, whilst developing a gelatine plate with ferrous oxalate, the detail seemed to drag out rather slowly, and, according to Captain Abney's suggestion, I added a few drops of hpposulphite of soda to the developer. Part of the film blacked over rapidly, and my first thought was that the plate was fogged. However, I always fix so as to know the worst, and proceeded to do so in this instance; and was much astonished to find that the part of the picture where the hyposulphite had first come in contact with the film was positive, the remainder, representing principally the highest lights, being still negative. I proceeded to make a series of experiments, using in the first instance some plates of my own manufacture consisting of bromide alone, and succeeded after a few failures in producing some very fair specimens of complete reversal. The experiments were made by printing in a frame under a negative by gaslight, developing with ferrous oxalate, and then adding hyposulphite of soda at a certain stage of the operation.

Some of the negatives so obtained are complete, and give fairly good prints; others are partly positive, and partly negative. The colours of the finished negative vary very considerably, according to the character of the plates employed. Those which contained bromide of silver alone, give a magnificent brown colour. Commercial plates, the composition of which I don't know, but which probably contain chloride, give a purple black tone. The method I followed was simply to expose a gelatine plate under a negative for about half the time necessary to give a good transparency, and then develop with mixed solution of potassium oxalate and ferrous sulphate. After the picture has commenced to appear, and a certain amount of density attained, I pour in 25 ounces of hyposulphite of soda. The plate, which, up till now, contains a positive picture on a white ground of bromide of silver, begins to close over, and eventually the film becomes entirely opaque. When it has become so, the reversal is complete; and any further treatment will cause increase of density. The plate may be now washed and fixed.

Sometimes there is a bronze deposit on the surface of the film, probably due to sulphur, which, however, can be removed by rubbing the plate lightly with the finger while in the fixing solution, or after washing with a pad of cotton wool.

So far as I can make out, dense negatives require a different treatment to thin, soft pictures. In one case I exposed a negative in which no very decided contrasts existed in two portions—the one receiving five seconds, and the other two seconds at about four feet from a fish-tail burner, turned about half down. On development, the portion that had received five seconds came up rapidly, and, when fairly dense, the second portion was about half developed. The hyposulphite was then added, and when the film was fixed, the portion that had received five seconds showed a thin image, while the part which had had only two seconds gave a capital printing negative in no way inferior to the original negative. Negatives which are dense, and contain brilliant contrasts, should acquire a fair amount of density before the hyposulphite is added; in fact, the development should represent about nine-tenths the correct amount. Weak, soft negatives should be about half developed when the addition is made.

I have not the time, occupied as I am all day on engineering works, to go into the subject exhaustively; but I hope that others will take it up, and, if possible, work it to success, as there is no doubt that the process holds out great possibilities, if its operation can be determined rationally, and not depend simply on empirical rules. If the method is to be relied on, it will be like Mr. Bolas' or Mr. Brooks' method, of great service in producing reversed negatives, which are necessary in the case of many of the modern photo-mechanical printing processes, and it has the advantage of being much simpler in its operations than either of these two.

I hope that if other experimenters devote any attention to the matter, they will communicate to the News the results of their experiments.

LANTERN MATTERS.

BY W. J. CHADWICK.*

My attention was called to a letter in last week's *British Journal* on Lantern Matters, signed "Pro Bono Publico," of Manchester. As I never care about entering into discussion with gentlemen who cannot afford to use their own names, and as the subject of enquiry is on that doubtless started at one of our recent meetings for the benefit of the members, I would like to have this opportunity to reply. "Pro Bono Publico" asks first:—Can a tap, having control over only one jet, be correctly called a dissolving tap? In reply, I beg to say that such a tap is never, or hardly ever, used alone, but usually in two's or three's, and in such cases their use is dissolving, so I call them dissolving taps; but by any other name their action will be much the same, no doubt.

---

* Read before the Manchester Photographic Association.

Question 2 runs as follows: Suppose one jet lighted (full), could it be considered a perfect dissolve to light up the second jet (also full), and then turn down the first? In reply to this, I say yes, decidedly yes, in most cases; and all the best dissolving taps made for bi-unial lantern are arranged that this is so; for when the handle is midway, the lights of both jets are full on at the same time—a case often required when showing effects, &c. However, the single dissolving taps, such as I advocate for a triple lantern, possess the advantage that, if it is preferred, the light of the first jet may be turned down a little before turning up the second; they may be turned full on, full off, or anywhere, midway, all independent of each other and indiscriminately, and with greater latitude and success than any system I have yet seen.

Question 3.—"Are such taps attached to a triple lantern considered, as I have asserted, the proper thing, and are they in use by our principal exhibitors?"

These questions are a little indefinite, but my reply to the last question is also a reply to part of this one, as to the system I advocate, the three single taps for a triple lantern being used by our principal exhibitors. I can only say that I do know many high-class exhibitors that have adopted it.

And now for the fourth and last question. In my own experience, I prefer to adjust the jets with the dissolving taps full open at the commencement of an exhibition, and never to touch them again, unless it is a case of necessity, during the exhibition.

At Home.

DR. HUGGINS AT UPPER TULSE HILL.

"Here are my star photographs," said Dr. Huggins. A small drawer is before us filled with neat little leather boxes, that might be jewel cases, only that their contents are more precious than jewels. For truly no labourer in the diamond fields ever worked harder than Dr. Huggins has done to secure these tiny gems. Here is a tray of them! Each represents a glinting star from our lustrous firmament. This one is Sirius, or the Dog Star; this is Vega; this, one of the glittering constellation known as the Great Bear; another is Arcturus; yet another Capella; and this last, the yellow star Aldebaran. Were they but rubies and sapphires, a lucky search would have secured them in a month; as it is, they represent the labours of a life-time.

They are minute photographic negatives, as we see clearly enough now we are permitted to take one in our hands and examine it under a magnifier. The image is half an inch long, and about an eighth of an inch broad, a little white band with zebra stripes—or more, perhaps, like a bit of bamboo straw with well-marked joints. The stripes are not all of the same thickness, nor are they always at equal distances, and it is to this circumstance particularly that our host calls attention, for on the presence or absence of these lines the whole teaching of Dr. Huggins' wonderful discoveries in connection with the star world depends.

But we must go back a little to explain Dr. Huggins' research clearly. For instance, they teach us, as we shall presently see, how it is possible to classify the stars; how some are very much like our sun—which is simply a star, and nothing else, and only appears larger because it is not so many millions of miles off, as the rest of them—and how some are glowing masses of matter only just beginning to burn, while others have been alight so long that they are nearly burnt out. These old, worn-out stars—or suns, if you like to call them so—will in all probability soon become but a mass of cinder or pumice-stone, such as our moon now is, which, as everybody knows, gives forth no light itself, and only shines when it reflects back the sunlight thrown upon it.

The pictures before us are not simply photographs of the stars, but photographs of the spectra of the stars. And, here, please, one word before embarking on our explanation. Lest the reader take fright at the word spectrum, or spectra, we want to say at the outset that we are not going to use any scientific terms whatever, or allude to any abstruse matters. We are going to give as unscientific an account of Dr. Huggins' investigation as we possibly can; that is our only object, and we shall be but too pleased if we err on the side of puerility.

We say Dr. Huggins photographs the spectrum of a star, and not the star itself, and this is easily explained. Everybody who has entered a room in which a chandelier with glass drops happens to be, or lustres on the mantelpiece, knows very well that the colours of the rainbow frequently hover about them. The reason of this, too, most people know. A ray of sunlight, or daylight, however white and shining it appears under ordinary circumstances, is made up of a bundle or faggot of coloured rays, and the coloured rays are seen whenever the faggot gets dispersed. Many things will cause the dispersion of light, and turn a white ray into a broad coloured band, or ribbon of red, yellow, blue, and violet. Out of doors the rain often does it for us, and then we get the rainbow, but indoors the dispersion of light is generally due to the triangular or prism-like drops of our chandeliers and lustres. Whenever you put a prism of glass in the path of a beam of sun-light, you get this dispersion or separation of the faggot; and this dispersion is called the spectrum. If it be a beam of sunlight that is dispersed into colours we call the band of colours the spectrum of the sun or solar spectrum; if we look at the light from one of the stars, putting first of all a prism in the way between our eye and the star to disperse the ray, then the colours shown we term the spectrum of a star.

"But what amount of light can possibly come from a star?" the reader will exclaim. "Surely the twinkling spots we see in the heavens are not sufficient for dispersion, and for the formation of a coloured rainbow or spectrum." We answer, not only is the light of our stars sufficient to give a tiny rainbow—by making it go through a prism—but this tiny rainbow or star spectrum can be photographed, thanks to rapid gelatine plates, and it is just this wonderful feat which Dr. Huggins has accomplished.

Of course, in his tiny pictures, we see no colour; this has yet to come. But we see something that is more important even than colour. We have spoken of star spectra, and of the spectrum given by the sun, and we may mention that most bodies that emit rays are capable of furnishing a spectrum. A red hot poker, for instance, will give you a spectrum, and so will a glowing coal. But if you want to see the colours to perfection, as they come from the prism, you must look at them in the dark; just as in camera work, you can see best to focus when extraneous light is cut off. Thus, if you darken the room in which your prism is, and only let in a beam of sunshine through a chink in the shutter, your colours, or spectrum, or rainbow, whatever you choose to call it, will be very vivid. You see the white ray coming sharp and straight from the shutter to the prism, and then dispersed into a spectrum. The more narrow your chink or slit, the clearer will be your spectrum, and when you have narrowed the slit to something like $\frac{1}{350}$ of an inch, you will find in the spectrum something more than a row of mere colours. You will see a lot of little upright lines, which you have not seen before; and it is these lines, particularly, their place in the spectrum, their number, and their thickness, which is of importance. They are a language, which we cannot as yet read distinctly, but which, little by little, we are beginning to understand. Already these lines in the spectrum have told us much of which before we knew nothing; what they will reveal in the future, the future alone can tell.

Dr. Huggins, then, photographs the spectrum of a star; that is, he does not present his camera directly at the heavens; before the light of the star is allowed to shine upon his sensitive plate, it is compelled to pass through a prism to be dispersed, and it is this dispersed light—this band of colours—this spectrum—of which he gets an image. And he gets not only an image of the spectrum, or rainbow, but of the little upright lines in the spectrum, too. As we said before, his negative pictures are little white bands with "zebra stripes," these stripes, more or less vivid, being no other than the lines in the spectrum.

Now, what do these lines mean? They have reference to certain metals or substances. Thus, if we take a spoonful of common salt—or chloride of sodium, as chemists call it—and burn it in a flame, and then examine that flame, we shall find in the spectrum that it casts an upright line of a vivid yellow. This line appears in the red part of the rainbow, or spectrum, and whenever sodium is present in a flame, no matter how minute the quantity, this line always makes its appearance, and always in precisely the same position of the spectrum. We can only argue one thing from this; that there is sodium present whenever we see the line. Hence it is called the sodium line. Mr. William Crookes, the first editor of the Photographic News, one day burning some sulphur, and looking at the spectrum of the flame, discovered, to his surprise, a line he had never seen before. It was a single green line, and hence he knew there must be something present in the flame of which chemists at that moment knew nothing. He proceeded with his investigation, and, in a few days, was able to announce to the world that he had discovered, through the medium of the spectrum, an entirely new metal, to which he gave the name of Thallium.

Since, then, the lines tell us of the presence of certain bodies we have in the spectrum, we have here a very easy and simple way of finding out what is in a substance that is burning. We can tell if it contain copper, iron, sodium, &c. The lines proclaim the fact at once. It is, in a word, a most efficient and quick method of analysis, this method of spectrum analysis. A ray of sunshine, falling upon a prism, and dispersing, exhibits lines that leave little doubt that in the glowing mass we call the sun there is sodium, iron, hydrogen in vast quantities, &c. Dr. Huggins, in like manner, has examined the light from various stars, and, from the lines he has obtained, he tells us how, in the bright star Sirius, there is sodium, magnesium, hydrogen, and iron, and in the red star Aldebaran these are to be found in conjunction with bismuth, antimony, and mercury.

Now we come to the important task which photography has fulfilled in connection with this wonderful investigation. We have hitherto spoken of lines visible to the eye. But, at one edge of the rainbow, or spectrum, in the violet and lavender regions, there are lines which are invisible to the eye, but which can, nevertheless, be photographed. Dr. Huggins, indeed, does not care to photograph more than half the spectrum; the red and yellow parts he can best examine with the eye, and therefore he confines himself to photographing the lines in the violet and lavender regions, and in the region beyond, which, curiously enough, we cannot see at all. And it is precisely these regions that appear to be most interesting so far as the stars are concerned. His little photographs show at ocne that there are, at any rate, three distinct classes of stars. There are those, for instance, which give twelve distinct lines, or zebra stripes. These lines are evidently due to hydrogen, and denote vast masses of this inflammable gas to be present in the stars. All white stars give these twelve lines, such as Sirius, Vega, the Great Bear, &c., and for this reason it is presumed that they are youthful stars. Next, there are stars that give lines, or spectra, so much like the lines given by our own sun, that they are doubtless of the same age, and have been burning about as long; Capella is one of these, which, among other things, do not show the hydrogen lines so perfectly. Finally, we have old suns, like Arcturus, and the red star Aldebran, which seem to be rapidly burning themselves out; the spectrum here is very different, the twelve hydrogen lines, as an instance, being reduced to six.

Dr. Huggins invites us into his observatory, and we climb the stairs in his company. We make our way through a well-appointed laboratory, then ascend into an apparatus room, full of magnificent electrical paraphernalia and optical appliances, and finally, pushing open a trap above our heads, reach the "star chamber." It is not very high up, after all, where Dr. Huggins holds communion with the stars. Yet we may here see farther into the heavens than from the loftiest spire upon earth.

In the centre is a vast telescope, some twelve feet long and twenty inches in diameter; it is inclined upwards through an orifice in the roof, the roof itself being dome-shaped, and capable of revolution, so that the whole hemisphere of the heavens may in turn be examined.

It is here that the work to which we have alluded has been performed—work which may seem simple enough to the reader, but which has involved the exercise of patience and perseverance indescribable. Who shall tell of the countless watchings, the indomitable fortitude, the persistent activity by which the triumph has been gained? Fortunately, our worthy host has a worthy assistant in the person of Mrs. Huggins, to whom is due, in no small measure, the success of his labours. Our readers know full well how feeble is the light of a star; and when they bear in mind that only as much of that light as can come through a slit $\frac{1}{350}$ of an inch is permitted to act on the photographic plate, this light being not in the form of a pin's point, but spread over half an inch surface, they will understand that a long exposure is necessary. Sometimes, indeed, two hours are required to impress the image, and during the whole of this weary interval it is the duty of the doctor's chief assistant to watch that star, and see that it remains in its proper place upon the slit of the instrument. The stars, as we all know, are constantly moving—or, rather, the earth is, which is the same thing—and the consequence is that the big telescope, in which the camera and spectrum apparatus are placed, has to be kept moving, too, by clockwork, to keep up with the star. But, delicately-regulated as the clockwork is, it cannot always be depended upon to move the telescope exactly at the same rate as the earth. For this reason it is that Mrs. Huggins duly watches to see it do its duty, the lady having appliances at hand whereby she can amend the speed, and catch the star again by going a little faster, or slower, as the case may be.

Mrs. Huggins is also an accomplished photographer, and is conversant with all the advances recently made. Indeed, it is only, as one can well understand, with the aid of very sensitive gelatine plates that some of the stars—the red ones and the yellow ones particularly—can be made to tell their interesting story. "It is all very well to speak lightly of doubling the exposure," said Dr. Huggins, "when it is a question of but seconds only; but, in my case, it is a matter of hours." Dr. Huggins, in his work, soon gets to know of a plate's sensitiveness; making long exposures during the weary watches of the night is a crucial test for the sensitive film.

And now, if the reader will but listen another moment, we can, in a very few words, explain how Dr. Huggins does his photographic work. We have said that the little camera and spectrum apparatus are inside the telescope, and we have explained how it is necessary, in order to get a proper image upon the sensitive plate, that the light from the star should shine into the apparatus through a tiny slit not more than $\frac{1}{350}$ of an inch broad The great thing to be accomplished, therefore, is to get the little luminary to settle exactly upon this sl and *to keep it there* during the long time necessary for the exposure. It is done in this way. The telescope, which is nothing more than a hollow tube, is directed towards the heavens, and in such a way that the star shines down the tube. There are many stars, of course, but Dr. Huggins has only to do with one at a time. At the bottom of the tube or telescope is a mirror, and the consequence is that the star, looking down the tube, shines upon the mirrer. The mirror, then, by careful handling, is made to reflect the particular star upon the slit of the camera apparatus, and very nicely indeed has the mirror to be adjusted to do this. But this difficult task it fulfils, nevertheless, under the skilful hands of Mrs. Huggins, and to that lady, as we have said, falls the onerous duty of continually watching to see that the tiny spot of light keeps hovering over the slit. Of course the big telescope is moving all the while, and the camera inside as well, by means of the clockwork, to which we have referred, in order to keep up with the moving star; but let the mechanism be ever so well-regulated, it requires unremitting attention, so that, as we have said, the eye has continually to watch the position of the star upon the apparatus the whole weary time of the exposure.

It is only on certain nights in the year that star photography is at all possible. You must be for ever on the alert, watching your opportunity. The night must not only be clear, but steady. After rain the stars are sometimes very bright, and they do not twinkle, a sure sign of atmospherical disturbance. Here is the tiny camera fixed at the end of the spectrum apparatus, and here the little dark slide that receives the plate; it is half-an-inch broad and two inches long—surely, the smallest dark slide in the world! Autumn and spring Dr. Huggins prefers for his photographic work, and, if possible, he brings his labours to an end at midnight. In wintry weather he can commence work about six; but in the summer time he has sometimes to wait till ten before the stars are bright enough for his purpose.

Next week "By-the-Bye" will be "A Faded Carte." The following "At Home" will be "Messrs. Window and Grove at Baker Street."

Notes.

Dr. Eder, of Vienna, is writing the early history of photography.

M. Janssen has been busy photographing the nebulæ. It is comparatively easy to get an image of the brightest parts, but very difficult, it seems, to get complete images at one exposure to serve as records for future comparison. To aid the astronomer, therefore, the French *savan* proposes to take pictures first of the brightest portions, and then a series of pictures upon plates a little out of focus, so as to give luminous circles. Photographs, sharp and unsharp, of the nebulæ will together supply a history of the phenomena of considerable value.

The electric light is found capable of bleaching albumen. Blood albumen from which the blood corpuscles have been removed, whether it is in a solid or liquid state, is acted upon equally, twenty-four hours being sufficient for the purpose. The electric light is simply reflected upon the glass vessel containing the albumen, or upon the dry material spread out upon a flat surface.

Several officers now engaged with the Boers in South Africa are provided, we hear, with cameras and gelatine plates.

Last week we congratulated Mr. Swan on having parted with his electric invention for a handsome sum; the Swan Electric Light Company has now been registered, and we are at liberty to mention particulars. The capital of the company is £100,000, of which Mr. Swan is to be paid £25,000 in cash, and £25,000 in fully paid up shares. Moreover, Mr. Swan is appointed for fourteen years managing director at a salary of £1,000 a year.

Connecting two wires with a bridge of carbonised paper, and compelling an electric current to pass over this carbon bridge, which is thus made to glow and to emit light, is the theory of the Swan electric lamp; but it is a theory not easily brought into practice. Carbon, highly heated, combines with oxygen in the atmosphere, forming carbonic acid, and then your bridge falls to pieces; while under any circumstances a structure of carbonised paper is not calculated to hold together very long. These, then, were the two great difficulties Mr. Swan had to overcome: to keep air away from his glowing carbon, and to make the carbon bridge, or thread—for it looks like a black horsehair—of a durable character.

Many years ago, Mr. Swan set carbon aglow with electricity in a glass vessel from which the air had been exhausted, but the expedient at that time failed. Since then Mr. Crookes has shown us that in a more complete vacuum than the one with which we were formerly acquainted, things are possible of which physicists ten years ago little dreamed. Mr. Crookes' so-called "light-mill" was set going in this vacuum, and altogether it awakened us to a new condition of things. It was, in fact, a new world that Mr. Crookes discovered, a new atmosphere—except that there was no air in it—in which things behaved themselves differently to what we are accustomed to see them in the solid, liquid, and gaseous state. Mr. Crookes, in a word, showed that there is a fourth state of matter in this world, just as we have recently developed a fourth party in Parliament, except that the latter is of no importance.

Mr. Swan tried his experiment again in the newly discovered world, and lo! the result was success. His carbon thread was no longer attacked by oxygen. It then only remained to obtain a durable carbon filament, and this he seems to have secured by carbonising paper parchment—that is, bibulous paper treated with acid—which yields a tough and flexible thread. Making connection between the carbon and platinum wire, and inserting the wires into the glass vessel, were among the minor difficulties to be overcome before Mr. Swan's lamp was perfect. To get an intense and powerful electric light is comparatively easy; the great point of novelty in Mr. Swan's lamp is that it can be made to give a weak light, equal, if need be, only to some thirty candles. We may be sure that now a company has been formed, one of Mr. Swan's first endeavours will be to 'supply the photographer with cheap and efficient illumination

It is no secret that at the last Exhibition at Pall Mall a valuable piece of apparatus, the property of Messrs. Marion and Co., of Soho Square, as well as one or two other objects of minor value, were stolen. An unpleasant rumour now comes from Bristol that a similar theft was perpetrated during the recent Exhibition there; a Hare's camera, a Ross lens, and a Hunter and Sand's shutter were carried off during the temporary absence of the attendant. The loss has, unfortunately, fallen upon those gentlemen who were good enough to guarantee the expenses of the Exhibition. Photographers are often known as dark-fingered members of the community; but we certainly object to have the light-fingered in our ranks also.

Captain Turton writes us, from Florence, that the art world—both painters and sculptors—make good use of photography in their work. Mr. Longworth Powers, a son of the well-known American sculptor, Hiram Powers, follows the example of Adam Salomon, and is both sculptor and photographer. The Florentine photographers are as yet, it appears, sadly ignorant of the capacity of gelatine plates; gelatino-bromide is still an unfamiliar compound, and has been tried, if tried at all, only by way of experiment. We know, of course, that the preparation of gelatine plates was never more brisk than at present, and that the number of films that go out into the world from British manufacturers alone is something incredible; and yet a large collodion maker assured us that last year he supplied more collodion than in any previous twelvemonth.

Topics of the Day.

RETOUCHING FOR BEGINNERS.

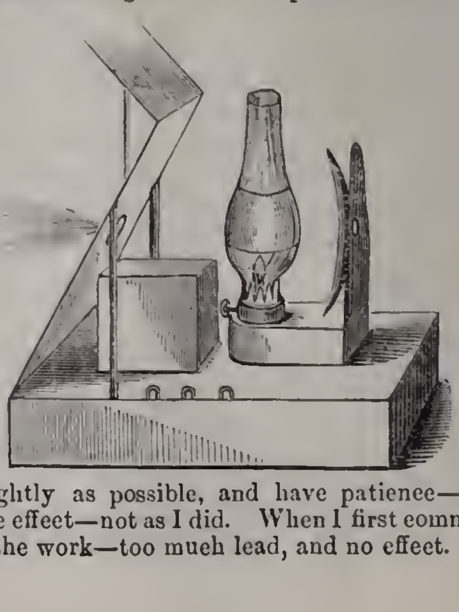
BY HENRY MORGAN.

For the benefit of the beginner I think it necessary to commence the subject with the description of negative most suitable to work upon, the pencils to use, &c., so that he shall not get disheartened with his first few strokes caused by an unsuitable bite. I will give him the preliminary requirements, and, having started him, he will be in a fair way to learn, with patience, the beautiful art, for such it is when worked wisely, but not too well.

The negative most suitable for retouching is one which is well exposed (not flat), but with full detail; such a negative is usually got with the first development if the negative bath, collodion, &c., work in unison; if it be much under- or over-exposed, it must be left to the more experienced, but such a negative as the above is the one for the beginner to start with. The varnish should be hard (more especially for gelatine plates). The best medium I find is this: to one ounce of spirits of turpentine add ten grains of gum-dammar and a few drops of oil of lavender (the latter merely to give it a pleasant smell); drive a cork tightly into the bottle; cut it off close to the neck; then make a hole in the centre, which will allow a little of the solution to work out when pressed; you are not bothered with upsetting it then; apply a very little of this to the part to be retouched with the finger; rub round with a circular motion, until you find it slightly sticky: you will find you can work from the lightest touch to the deep shadows with hard pencils; soft ones are liable to crumble, and leave specks where they are not wanted; this can be used with safety on gelatine plates, before varnishing, with a very pleasing result, and the finish put on it after varnishing. Faber's HB to HH and HHH are most useful, and to sharpen them, glue some fine emery paper to a piece of wood, like a razor strap; rub the pencil on this until you get a fine, longish point. I need not mention the desk; any ordinary desk will do, only do not use a mirror for reflecting the light; it is a mistake, and only tries the eyes; use white paper for wet plates, and for dry, if they are thin and rather yellow, use paper of a bluish or greenish tint, and less light—or, better still, retouch through very thin opal; this gives more body to gelatine negatives.

Before starting, please remember the three P's—patience, perseverance, and practice; bear in mind these, and success is certain. Do not be in a hurry to get over the face with dots and lines, piling on the lead with the idea of making a grand stipple; if you do, you will be sorely disappointed, when you fancy it finished, but take it easy. Commence at the right hand side of the forehead, with light, circular strokes through the imperfections, from right to left, blending, as you go, the uneven parts with their surroundings; do not touch on any part but these; continue to the temples; turn the negative, and work the cheek, the deep shadows under the eye, and about the nose and mouth; do not obliterate, but soften them; continue working in the direction of the facial lines, always inclining them inwards, which gives rotundity. If you follow these instructions, you will find the dirt, as it were, worked out of a face which is sufficient to produce a good print. A considerable amount of practice is required to give what is termed a stipple, and is produced by various systems of working. A very fine effect is produced by dots alone, another by dots with tails, and by crosses curved; but the beginner must not tread out of his path until he has mastered his first lesson, and can work on a face without leaving patchy traces of the pencil; then he can try his hand on any fancy work he likes, and can stick to any method he thinks proper; but the least work with the most effect is to be aimed at. In using colour for stopping out holes, &c., that will not take sufficient lead, neutral tint for wet, and olive green for dry negatives with yellow films. Do not be disappointed with your first attempt; I promise you plenty of troubles with the different kind of negatives, but plod on. With my first lessons I used to watch the retoucher attentively, and gaze on in wonder and admiration to see him with apparently careless curves blend and stipple most beautifully, which seemed to me a mystery then; but as I stuck hard at it, I found, when I had mastered the strokes, that I was able to work either very smooth or stipple; then it was safe to employ any system. If the work on a negative is not satisfactory, you can take it off with a handkerchief moistened with the least drop of the medium, and commence again.

I must warn the beginner not to pile on the work, but work as lightly as possible, and have patience—he will soon see the effect—not as I did. When I first commenced, I piled on the work—too much lead, and no effect. I was



going to say the negative was heavy with the lead. However, I could not put any more on it; and, as I have, you will have to buy your experience.

For those who would like to practise at night, a certain kind of light is required; this can be produced easily, which will be seen in the sketch.

An ordinary tin lamp, with reflector, costs about two shillings, which is placed behind the desk. Use a piece of opal (the dead side) for the lamp to reflect on; place a small box or anything handy under the aperture, so as to bring it within an inch of it; by varying the light you can suit it to thick or thin negatives. I do not find it injurious to the sight; but it would be advisable for anyone to wear spectacles with a blue or green tint, for without good eyesight the photographer is lost.

The "Topic" next week will be, "Gelatine Plates for Interiors," by H. Manfield.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

IV.—Preparing and Developing the Plate.

Having now prepared the collodion and sensitizing solutions let us take a plate, and make an exposure in the camera, that we may test the working qualities of our chemicals.

Coating the Plate.—Unless a very large piece of ferrotype plate be used, it will generally be found sufficiently stiff to allow of its being coated with collodion without bending. If very large or limp, the glass backing from the dark-slide may be placed under it.

Lightly brush over the surface with a camel's-hair brush, to remove any specks of dust. Balance the plate on the tips of the fingers, and hold the edge by the top of the thumb—the fleshy part slightly bending over the plate. Pour a circular pool of collodion on one corner, and tilt the plate so that the fluid runs to each corner, flowing just to the edges, but not running over. Pour the surplus collodion back into the bottle. Gently rock the plate until set—*i.e.*, when an impression of a finger tip is taken as on soft wax.

The manner of rocking the plate while it is drying materially influences the character of the film. If, in pouring off the surplus collodion into the bottle, the plate is held on end, the flow back is rapid, and the film thin. This is necessary when the collodion sets rapidly, as in warm weather. On the other hand, should the collodion be very fluid, the position of the plate should be but slightly altered from that in which it is held during the coating operation, so that the re-flow may be retarded.

When the collodion film is properly set, the plate is placed on the dipper, thin edge downwards, and gently lowered into the bath.

Sensitizing.—The descent of the plate into the bath must be effected steadily, evenly, and without stoppage. Steadily, or splashes will stain the film; evenly, and without stoppage, or horizontal lines will mark the place where the surface line was at the moment of stoppage. When the plate is fully submerged it should be quietly moved about in the solution for a few moments, to overcome the repellant nature of the alcohol and ether in the film. The plate is then left in the bath for about two minutes; the exact time for sensitizing being dependent on the nature of the film and the state of the bath; and a knowledge of these varying conditions is the result of experience.

In a dark room, the door being closed, on placing the plate in the bath, the action of the solution on the film may be watched by withdrawing the plate at intervals. Shortly after entering the bath the film bears the appearance of a greasy plate on which water has been poured. After a little movement of the plate in the bath the solution will be found to run down the surface in lines, and the film is bluish; later the film has assumed a creamy colour, and is even and opaque. The plate is then left for a few moments longer before being removed.

In the Holder.—First the plate, on being taken out (which should be done steadily) is allowed to drain on the inside edge of the bath, then on a clean sheet of blotting-paper. It is now placed face downwards in the holder—*i.e.*, the back of the plate to the spring of the holder. When resting in position, a sheet of glass, cut exactly to the size of the holder, is placed over it, and the back of the holder closed and fixed. The holder is now carried to the camera, care being taken that the silver is not allowed to run back over the film.

Exposure.—Of this nothing definite can be said, as it depends on so many conditions which are constantly varying. Carefully note the appearance of the image on the ground glass while focussing, to form a correct estimate of the force of the light, and so to judge of the time required.

Care must be exercised in the movements of the sliding holder in exposing for several pictures, as a wrong movement causes the spoiling to two pictures; and where a number of lenses for gem pictures are used, a considerable portion of the plate is lost.

The pose should be carefully made. Before posing the sitter, the operator should have a definite idea of the effect he wishes to produce, and lose no time in carrying it into practice.

Fussing and bothering about in aimless endeavour can never accomplish any good thing.

Move backgrounds and accessories as quickly and quietly as possible.

Focus accurately, and with as little delay as may be.

Insert the plate-holder; time the exposure properly, or at least evenly, in the case of several exposures; and be careful of the movements of the holder if a multiplying camera is being used.

Development.—To bring out the latent image, formed in the camera, a solution of ferrous sulphate (protosulphate of iron) in water is used.

A considerable difference of opinion exists as to the strength of the solution producing the best results; but as the following has been found to produce very fine effects, there appears to be little object in entering upon discussion; especially as the space allotted to these notes would become exhausted long before we had reached the later manipulations, if we entered into lengthy considerations of this kind.

Water (ordinary)	16 ounces
Ferrous sulphate	1 ounce
Acetic acid	1 ,,

The operation of developing is conducted by the non-actinic light of the dark room.

The plate-holder, in which the exposed plate rests, is placed on its stand, the back opened, and the plate removed. It is best to have a glass on which to rest the plate during development, otherwise it will probably bend and the developer spill. Take the plate in the left hand, and in the right the vessel containing sufficient developing solution to cover the plate. Pour the developer quickly but gently over the film, surely overflowing the entire surface, taking care it does not overflow the edges of the plate.

If the exposure has been exactly timed, the image will begin to appear directly the solution has covered the plate, and grow until the image stands out boldly. Without delay the developer must be washed off under a copious flow of water from the tap, and the plate thoroughly washed.

Should the image flash out instantaneously, it is a sign of over-exposure. The sitting should be made over again, as such a picture can never be more than passable. We shall, however, give, in a later chapter, a hint for improving a picture over-exposed, when there is found necessity for making the best of it.

Under-exposure of the plate is evidenced by the tardy and unwilling appearance of the image; it will, when fixed, be harsh and wanting in detail, and, if very much under-timed and the development forced, the shadows will be found fogged, or covered with a grey deposit. An over-timed picture also is often foggy in the shadows from the rapidity of the deposit of silver.

Absolutely correct timing of the exposure is the most important of the manipulations, as, failing in that, the most artistic posing and lighting, and perfect action of chemicals, go for nothing. Judgment of the requisite exposure comes by experience, and by experience only.

But giving all this, an artistic pose, perfect illumination, chemicals in splendid working order, and correct exposure, failure is sure if the manipulation of bringing out the image is conducted in a careless, thoughtless, and inexperienced manner.

A nice discrimination, a quick eye, a deft hand, and thought are required.

A perfect ferrotype should be round and vigorous, full of detail, the high lights pure, and the shadows delicately graded down to rich pure colour where the film is perfectly transparent, and discloses the rich polished surface of the varnished plate.

Sometimes it may happen that the film repels the developer. This generally happens when the sensitizing solution is charged with alcohol and ether. When this is so, the developer is said to "crawl," and a slight addition of alcohol to the developer is recommended. When the bath is in this state it requires purification by heat.

The operator must endeavour by close watchfulness to recognize the effect of the developer under different conditions as they arise. There should not be at any time the slightest ground for doubt as to result in so far as the work of the operator himself is concerned.

(*To be continued.*)

ON SENSITOMETERS.

BY LEON WARNERKE.*

ALMOST from the first days of photography the want was felt of some ready means whereby the actinic action of light produced on various substances affected by light could be measured, and also equally ancient are the different systems proposed to obtain this object. One, which is very simple, and which was more patronized by many investigators than any other, consisted in the use of a semi-transparent screen of varying opacity, interposed between the source of light and the material sensitive to light. By observation of the visible or developable action of light passing through various opaque portions of the screen, an opinion is formed of the accumulated action of light during a certain period, and the intensity of the light is thus ascertained; on taking both of these into consideration, the sensitiveness to the material used is determined. It is not my object to enter into the historical development of various actinometers or sensitometers; I may only mention that, in "Patent Specifications" for 1866, September 13, No. 2,355, we find provisional protection was given to Louis Bing, for an apparatus to measure the actinic power of light numerically, in which "a graduated transparent medium is used, varying in transparency." Numerous, also, are the designs known at this moment, such as the photometers of Vogel, Vidal, and Lamy, in which various layers of paper are superimposed, and numbers printed on them. All these were designed especially for use in working the carbon process. For a similar purpose Hermagi's wedge of coloured glass was introduced. In 1876 Colonel Wortley described, at a meeting of this Society, a similar apparatus for comparing the sensitiveness of negative plates. He used layers of paper, from one to sixteen in number; the printing-frame, charged, was put in a certain horizontal position on the table, over which was a gas jet, with a paper cone to reflect the light on to the frame.

In consequence of the adoption of dry plates in photography, and with the multiplicity of formulæ for emulsion and developers, the want of an apparatus for comparing their various qualities became very urgent, a necessity felt even by the totally unscientific employer of these plates. Notwithstanding the venerable age of the photometers mentioned, they are not yet perfect, and that is the reason why we constantly meet with the expression "ten times as sensitive as wet," the meaninglessness of which it is superfluous to prove.

Let us examine one of these photometers of the latest form. They give certain numbers, but generally the relation between these numbers is not known. I have no doubt that exceptionally few investigators found that relation as compared to those who succeed in constructing two exactly similar apparatus; for with two the difference found in the numbers can be easily ascertained. This is only useful for the edification of that particular investigator; but the urgent necessity of the photographic world for the right apparatus has not been satisfied. Having these considerations in view, I decided to introduce into general use a sensitometer which has rendered me marked service for some time.

In the first instance, a form was produced representing twenty-five squares, varying from one to twenty-five thicknesses of paper. A mould from this is made for the purpose of taking Woodbury impressions, which are made on glass. By now examining this by transmitted light, we observe very perfectly graduated tints. On this surface are printed, in opaque matter, consecutive numbers from one to twenty-five. These, in pairs, being identically alike, are kept in a case, on the outside of which you can observe the cardboard disc, with numbers serving to calculate the relative value of the different tints.

The manipulation is as follows:—Suppose we wish to find which developer acts more energetically—pyrogallic or oxalate? For this purpose two identical plates are put behind two sensitometers, and exposed simultaneously to light. Then one of the plates is developed with pyrogallic, and the other with oxalate developer. Suppose now, that in the first case we can perceive the last number, 19, and in the second number, 10; to find the relation between these two numbers, the larger disc is revolved until number 19 (the higher number of the two) becomes so placed as to be visible in the slot. Opposite the number 10, seen on the smaller disc, we find number 4 on the larger one, which indicates that, to obtain the same amount of details, we must give four times more exposure in the case of the second developer than in that of the first.

This sensitometer enabled me to compare with precision two plates or two preparations, but it left still unsolved the important problem of a universal sensitometer, and this, I hope, is solved by the

Standard Sensitometer.

Photographic literature during the last six months has contained very numerous articles on the question of sensitometry: these are fresh in your memory. To avoid repetition, I shall not refer to these. In consequence of a proposal made in the Photographic Club, a committee was formed of the following members:—Captain Abney, A. Cowan, J. Cadett, W. Bolton, W. Bedford, H. Wilmer, and myself, to decide, if possible, the sensitometric question. Specially-constructed apparatus, elsewhere described, were proposed by Mr. W. Bedford and Mr. A. Cowan. For myself, I proposed to construct my special Standard Sensitometer, which, being more simple, was accepted, and constructed subsequently.

It consists of a glass quarter-plate having Woodburytypic impressions forming twenty-five squares, steadily increasing in opacity. To produce this impression, in the first instance, a model block was made in paper. The paper chosen for this purpose was very thin and uniform in texture, of 0·03 of a millimeter; it was stuck on the glass plate in such a manner that the first square had one thickness, the second two, and the last, twenty-five thicknesses of the paper. To cement these sheets of paper fresh albumen was used, for the reason that subsequent heat has no action on it, and the increase of thickness is more uniform and also less than it would be with gum, paste, or any other glue. When this was thoroughly dry, a series of casts in Spence metal was produced; one of these is preserved, and it is my intention to keep it in the library of the Photographic Club for any future reference. Next, impressions after the Woodbury fashion are made in specially-constructed presses. Gelatine ink was an object of special attention in this case. In my previous sensitometer I used as colouring matter sulphide of lead. This gave a certain brownish tint; but, in consequence of the different absorption for different rays, perfectly neutral black was substituted. The proportions of black, gelatine, and water, after being practically ascertained so as to give a certain amount of density suitable for a Woodbury impression, were noted, and carefully prepared in certain quantities. Resorcin, which, according to my experience, is th best preservative (antiseptic), permitted me to keep such prepared ink without decomposition for a very long time.

---

* Read before the Photographic Society of Great Britain.

During the process of printing, the temperature of the room and water in which the ink is kept was strictly uniform. A regulator of temperature, elsewhere described, by myself, rendered me on this occasion considerable service. The glass (patent plate), on which the impression was taken, was also kept uniformly warm by means of a box inlaid with thick felt, and holding a receptacle for hot water. Notwithstanding such precautions, a great many plates have been condemned as not fulfilling the condition of uniformity, the principal cause of the imperfections being the glass, and the difficulty of keeping the temperature of the room constant during the severe cold of this winter. The next operation was the printing of the numbers. This is done by a special process I adopted for this purpose. A black letter-press impression from a woodcut block is produced on paper, transferred to the glass bearing the Woodbury impression of the tint, and dusted with bronze powder to increase the opacity of the letters. At this stage it is varnished with shellac varnish to protect the gelatine surface from the occasional action of moisture, and the margins are then covered with red bookbinder's cloth, which, besides giving a better appearance, performs the more important duty of preventing blurring, which might destroy observations in the case of long exposure.

Having such sensitometers as identical as possible, and easily procurable, the only need will be to have some constant source of light, of unvariable intensity and quality, that can be produced by everybody. My first thought was to use the standard candle; but considering that the light of the standard candle is subject to considerable variation, dependent on surrounding conditions; that it is not everywhere procurable; that it requires special enclosure to avoid reflections; that it is not recognised or obtainable in other countries, I have made a proposition to use the light from a specially prepared phosphorescent plate.

I analysed the property of the light mentioned, and I discovered that its suitability to serve as a standard light for sensitometrical purposes exceeded my first expectations.

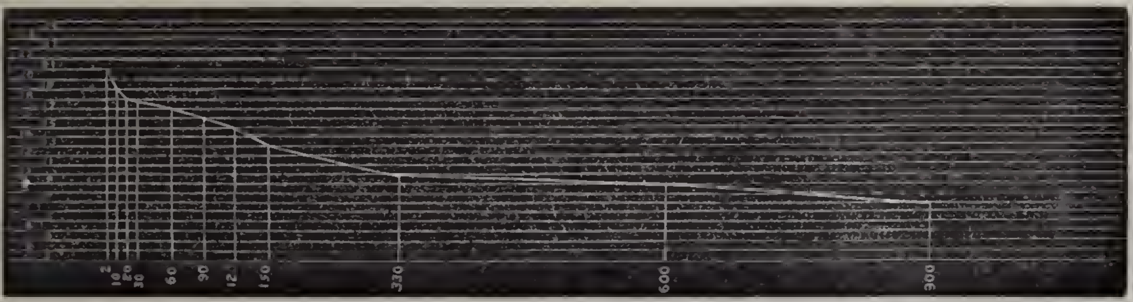
I prepare the phosphorescent plate in the following manner:—A large quantity of phosphorescent calcium sulphide is obtained in order to secure uniformity of the first product. This is mixed with melted (solid) paraffin and poured on to a previously warmed glass plate; while the paraffin is still in a liquid condition, it is shaken to distribute uniformly the powder which might sink to the bottom. Paraffin has many advantages over any other menstrum used to cement the particles of phosphorescent powder; it gives a surface perfectly white and more luminous than when varnish is used; it protects the powder most effectually from moisture and from carbonic acid, both of which have an injurious action on sulphide of calcium. This phosphorescent coating is covered with another glass, and the edges cemented.

To render this plate luminous, I propose to ignite close to it some metallic magnesium. Taking into consideration the unsteadiness of the flame produced by burning the commercial magnesium metal—due to various sizes and also the various states of oxidation—I had at first great fears as to the uniformity of the excited luminosity. But, to my great satisfaction, Mr. Cadett first observed, and I verified the same by numerous experiments, that a very small quantity of magnesium ribbon, when burnt, would excite the utmost luminosity in the phosphorescent plate, which luminosity cannot be increased by using a larger quantity of the ribbon, either in one length, or having several ribbons ignited simultaneously. This doubt being satisfactorily disposed of, I propose to excite the plate by burning one inch of magnesium ribbon (or not less than one inch) in close proximity to the phosphorescent plate.

Next, it was necessary to determine the influence of the temperature. Two experiments were made with this view—one in the garden during a cold night, when the thermometer stood exactly at freezing point—another in a room of 62 deg. Fah. temperature, and in this case the results were identical; consequently temperature can be disregarded, provided the plate, during the time of experiment, is not subjected to varying temperatures, especially after excitement.

The luminosity of the phosphorescent plate is constantly decreasing, and it is most material as to what moment after excitement the plate may be used as a source of light, because its intensity varies with time. In order to decide how long a rest is most suitable to satisfy all requirements, a series of experiments were made in the following manner:—A phosphorescent plate was illuminated with one inch of magnesium ribbon, and, after a lapse of two seconds, put in contact with the sensitometer, and a sensitive gelatine plate placed behind. Similar experiments were repeated, giving continually increasing rest to the luminous plate up to 900 seconds. All these plates were afterwards simultaneously developed, and the following results obtained:—

After a rest of	2	seconds,	last number developed was	20
,, ,,	10	,,	,, ,,	18
,, ,,	20	,,	,, ,,	17
,, ,,	30	,,	,, ,,	17
,, ,,	60	,,	,, ,,	16
,, ,,	90	,,	,, ,,	15
,, ,,	120	,,	,, ,,	14
,, ,,	150	,,	,, ,,	12
,, ,,	300	,,	,, ,,	9
,, ,,	600	,,	,, ,,	8
,, ,,	900	,,	,, ,,	6



By examining the curve formed on this diagram, it is evident, as was anticipated, that at first the luminosity rapidly decreases, but afterwards it becomes almost steady.

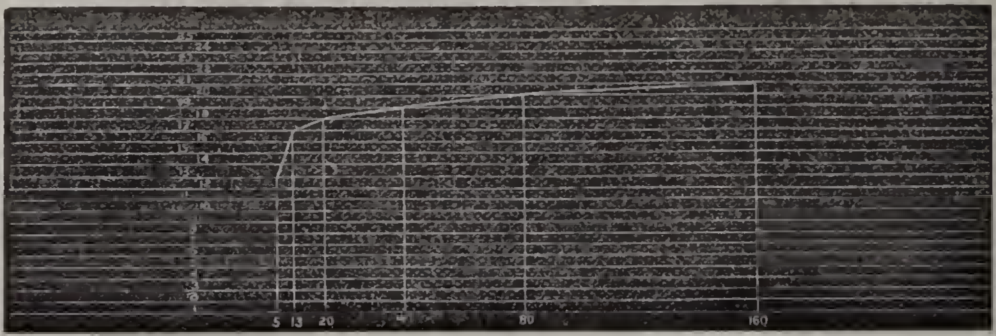
It would be perhaps desirable to use the plate at the time when the luminosity is most constant; viz., after 300 or 600 seconds—but the light becomes too much diminished at that period, and therefore, to avoid too long a delay in waiting, I think sufficient uniformity will be secured if the exposure begins after a rest of 60 seconds or 1 minute. However, this, as well as other points to be decided, are only proposed now by myself, to be sanctioned by the Committee before being definitely recommended.

There is yet another consideration, viz., what exposure to give to the plate after a certain determined rest? The following series of experiments were made to facilitate the answer to this question:—The sensitive plate was cut in six parts, and after a phosphorescent plate was exposed to the magnesium light, and had one minute's rest, it was used to act through the sensitometer on to these several plates during varying periods of time, as per table, and simultaneously developed with the following results:—

After	5	sec. exposure	No. 12	was developed
,,	13	,,	15	,,
,,	20	,,	17	,,
,,	40	,,	18	,,
,,	80	,,	19	,,
,,	160	,,	20	,,

After examining diagram (p. 94) you can observe that, adopting also sixty seconds as a time for exposure, we shall be pretty safe against the errors of timing, the curve in this point being pretty steady. We must, however, not lose sight of the fact that this curve does not represent intensity.

Lastly, for securing more uniformity, it is necessary to place the sensitometer at a certain uniform distance from the luminous plate. To obtain this end, I propose to use a specially constructed frame, in which there is a groove for the luminous plate, the distance between the exterior surfaces of the luminous plate and the sensitometer being equal to one centimeter. Between these there is a shutter, which will permit exposures strictly accurately to be made.



The relative value of the various tints, or numbers representing them, is then carefully calculated, and verified by a system different to that which was used for calculation.

This apparatus can be conveniently used to solve many questions of interest, not only to photographers, but also to scientists generally. For example, in the diminution of intensity of light in the phosphorescent plate, you observe one instance of the utility of the sensitometer. For photographers it will, no doubt, be desirable to know which plate is more sensitive, and at what ratio; which developer brings out the most detail; what exposure to give to the plates of any particular batch, &c., &c.

However, the most important point will be, if the sensitometer is generally adopted, that we shall be able to unmistakably express and compare our results in definite numbers.

THE ETHO-OXYGEN LIME LIGHT.

BY W. BROUGHTON.*

It gives me great pleasure to exhibit my automatic etho-oxygen lime light apparatus to you this evening: the more so, as an article has recently appeared in the photographic journals from the pen of Dr. Nicol, of Edinburgh, announcing a new discovery for the solution of the hydrogen difficulty. Of course he only threw out a suggestion: his friend, Mr. Morton, having soon found out its defects. My object to-night will be to prove that I have successfully accomplished the generation of a gas for the lime-light, and that in a generator so small that to many will appear incredible; also that I have had it in operation for two years, several members of this Society having seen it in work, and I have no doubt they will bear me out in that statement.

Previous to the year 1878 the management of the lantern and lime-light, to me, was *non est*; it was in the autumn of that year that my first introduction to it took place, through the medium of our mutual friend, Mr. Wright. As did Mr. Morton, so I soon found out the defects of my discovery; but these only aroused me to fresh activity, determined, if possible, to overcome them, and to try to maintain the prestige of Manchester in the race of improvements connected with the lantern, and to carry on the work begun by one whose name will be remembered in years to come as the originator of the system of generating oxygen during the consumption—I allude to Mr. Noton, who has so recently passed from amongst us, and whose mind up to the last was busy evolving fresh ideas and inventions. Nor must I forget the name of Mr. Dancer, who was the first to suggest the use of the lime-light for the lantern; and last, but not least, our worthy Hon. Secretary, Mr. W. J. Chadwick, who has, as Dr. Nicol justly remarked, done so much to popularize the process of oxygen generations. This apparatus is constructed for the purpose of generating what I call ethoxogen gas during the time of exhibition, and forms an addition to the generators, lantern-stand, stand, tables, reading desk, and box for packing lanterns, sheet, and apparatus. It is complete in itself, having no connection with house gas.

I will describe the working in detail, and will commence with the generation of the oxygen. Two charges of chlorate of potassium and binoxide of manganese, in the proportion of six of the former to three of the latter—which I may here say I find sufficient for two hours' burning—are placed in the two retorts, suspended from an arm by means of a bow cramp, through the top of which passes a T screw, enabling the retorts to be fastened or released very expeditiously. I have here two forms of connections—one designed to act as a safety valve, in which a spring is interposed between the bearing of the screw and cramp. The arm carrying the retorts is placed on the side of stand furthest from exhibitor, and is connected by means of an union to the tube conveying the oxygen to the lower chamber or gasometer, and which is an adaptation of Pepy's gas-holder. This is first filled with water, which rises by tube No. 2 into the tank, and by so doing, pressure is obtained. In this tank is a float, connected by a cord and pulley in the top with a lever. If spirit be used as the source of heat, this lever actuates a loose cap outside the burner; as the water rises in the tank the float does the same. The lever falls by means of a weight, causing the cap to cover the wick, and partially extinguish the flame. As the water falls, the action is reversed, the flame increases, and oxygen is given off a second time. Now comes into action another movement that obviates any attention to the retorts, the defect in all other inventions, and the chief objection to generation when the exhibitor has to lecture as well as work the lantern. The float this time sinks lower than before, and, in doing so, raises the arm that carries the burner; attached to it is a trigger that releases a spring. The arm now moves to the next retort, and the same process is repeated. As I have before stated, the two retorts are sufficient for over two hours, but should it be requisite to continue the generation, the retorts may be taken off, washed out, and refilled, the work of a few minutes, which any boy may do. Two taps are placed on the arm, and, by closing them, either retort may be taken off at pleasure, whilst the gas is coming from the other.

If house gas be used as the source of heat, a Bunsen burner replaces the spirit-lamp on the end of the arm; the cord is now connected with the extremity of the arm, which then falls as the water rises, and, by means of a tap joint, cuts off the gas, diminishing the flame, the arrangement for the movement of the burner being the same.

The oxygen gas emerges from tube No. 3, and passes into a Birrell's regulator, the object of which is to prevent any undue pressure during the time the oxygen is entering the gas chamber. I have only recently adapted this admirable regulator to my machine, and I cannot but speak in terms of the highest praise of its efficacy; and here, I may say, that it was through hearing of Mr. Birrell having invented an automatic machine I was set thinking, but as to its working or merits I had not the slightest idea. From the regulator it passes into the *multum in parvo*, viz., a chamber or box, four inches deep by three inches by one inch; this is my hydrogen generator, and contains four and a-half ounces of methylated ether, sufficient for three hours' working. Now you will see the derivation of the word etho-oxogen, viz., ether and oxygen. My first experiments were with gasoline and benzine, with a tank above twenty times the size of the present one.

I resolved to try ether after a careful study of the component parts of the light volatile compounds. The conditions I laid down were, that the material should be comparatively inexpensive, that it should contain little C (or carbon), plenty of H (or hydrogen), and I did not object to O (or oxygen). Methylated ether came the nearest to my standard. An agreeable surprise awaited me on trial, viz., the smallness of the consumption—about 1½ ounce per hour. If time permit at the close of our evening's exhibition, we will measure what is left; you will then see for yourselves what has been used. The oxygen, before it enters the generator, is tapped for a supply of gas to regulate the burners within the lantern, to which it passes by means of the dissolving tap, the apertures of which are alike, no by-pass being required, as both gases are cut off together; the arrangement for dissolving I show you presently. During the passage of the gas through this chamber it becomes charged with ether vapour; on its emerging from thence it passes into a safety tube; the principle of this is called the leech tube, a piece of strong india-rubber tubing closed at one end, with an incision down the side; the open end is now fastened to a brass tube having a collar or cap, screwing into a piece of wider tubing about six inches long, having a similar cap at the upper extremity. Water is now placed in the outer tube through which the gas bubbles; the object of this is to prevent the ingress of flame into the generator—not that I have ever found it requisite since I have used my present form of burner, which has a chamber filled with pulverised pumice stone, sifted to a certain size; this acts as does the gauze in the miner's safety lamp, in preventing the gas from firing. Other materials I have tried, but none so efficacious. I am not at all surprised at the statement made by Mr. Wiles that wire is of no service in a chamber, for I find that the oxyether flame will pass easily; but I cannot agree with him that platinum jets are useless adjuncts to a burner. With all due deference to his opinion, my experience, short though it has been, has taught me a very different lesson. My first points were made of that valuable metal, brass, which is all very well in its proper place, but that is not at the nozzle of the oxyhydrogen burner. I soon found them to deteriorate; not that they melted, but because the essence of the metal was all gone, and they gradually crumbled away. My advice is to those who have them, stick to them; and those that haven't, get them. I have found them a good investment. As the light is cut off altogether when dissolving, it is necessary to have a flame to relight when the gas is turned from one lantern to the other, which is provided by means of a reservoir, placed at the back of the burner, containing paraffine or spirit. I use the first, my lantern being constructed to enable the light for reading. The body of the lantern is made in two parts, the upper can be detached, and the lower used for oil if required. The two halves are pivoted at the front, with a thumb-screw at the back, which enables the discs to be adjusted.

---

* Read before the Manchester Photographic Society.

The lanterns stand on the top of the apparatus; tables are provided by means of falling doors to the right and left of exhibitor. The reading desk is formed of the door in front of exhibitor, being hinged at the top and divided into two parts; to the lower are attached two pins. These are inserted in holes in the top at right angles, forming a sloping desk at the upper part. The tank and falling sides form the box for packing lanterns, apparatus, sheets, &c. To make it more portable, the tank slides down the tubes which convey the gas and water, and which are also the support of it when in use. The object of its being raised is to gain pressure.

Another great convenience to me is the consecutive delivery slide box, by means of which it is impossible for the slides to get mixed, provided they are put in right, preventing meddlesome people from picking out a slide here and there "just to see what we are going to have to-night." It is on the principle of the railway ticket box. The slides are withdrawn halfway by means of a shutter, which prevents the pictures from being smeared with the fingers. I place the side of picture which has to be next the condenser upwards with the top of slide outwards; this, when taken hold of by the right hand corner, is ready for placing in the carrier. I have no need to look at them, and can place them in the dark.

My carriers are made to take 3¼, 4 and 4½-inch slides, and are simple in the extreme, being intended for use in the dissolving lantern. It is double the length of the lantern front, one-half being blank, which, when the half containing the slide is withdrawn, cuts off any stray light from the other lantern. At the extremity of the slide groove is a stop pivoted, and having three unequal sides, which, when the slide is pushed up to it, registers correctly. For 3¼-in. slides use the long stop, medium for 4 in., and short for 4½ in.

Correspondence.

GELATINE v. COLLODION.

Dear Sir,—In your "In and Out of the Studio" of last week you quote some remarks of Dr. Vogel which appeared in the German periodical edited by him. As Dr. Vogel's opinion carries weight with it, it is as well that when he unwittingly, no doubt, misleads in a matter, that at all events the English photographer should hear another side of the question. Dr. Vogel "confirms the opinion of practical photographers that the sensitiveness of gelatine plates is not more than four times as great as that of a wet plate." When I read this I was more than astonished; and all I can say is, that if the German plates have only that rapidity, they are far behind the English plates. It may be, however, that good English plates have been used by Dr. Vogel and the "practical photographers," in which case there are only two solutions to the enigma; either their development is at fault, or else their wet plates are much more rapid than any we have here.

This, then, is one reason why we should adopt some set standard of sensitiveness, such as, I hope, will be the outcome of Mr. Warnerke's sensitometer, which, I understand, he is busy preparing.

There is another point, which is somewhat personal to myself, in the same paragraph to which I have referred. Dr. Vogel objects that I have measured the sensitiveness of my plates by gaslight—presumably meaning by that light alone—and then enters into a proof to show that this should give false results. This is a real case of setting something up to knock it down. Had the Editor of the Mittheilungen enquired, he would have found that my measurements were made with ordinary daylight as well as gaslight, so his argument falls to the ground. I would ask Dr. Vogel a question: Has he ever practically compared (not theoretically) the sensitiveness of gelatine plates by means of gaslight, and afterwards by daylight? I have a great many; and by no manner of means would it be possible to reduce the sensitiveness of a plate from ten times to only four times that of a wet plate through the difference in the light of day and that of gas.

The gelatino-bromide process is essentially an English one, both as to the place of its birth, and of its entering into maturity. Whatever may be its faults at home (and it is not perfect), there is one that cannot be laid against it, viz., want of rapidity. I believe that even our worst enemies will hardly accuse English photographers of entering into a sort of long-firm business, which they might do if plates were issued stating that they were ten, twenty, or thirty times more rapid than wet plates, when they are only four times more so.—Yours truly,

W. de W. Abney.

INSTANTANEOUS SHUTTERS.

Sir,—I would call the attention of our friends who contemplate buying an instantaneous shutter, to the fact that most of those advertised at present, either open on one side and close on the other (disc shutters, for example), or else open at the top and close at the bottom (dropping ones, or sliding). Now, as pointed out some time since, the part of the lens first opened constitutes the lens, until the disc covers it up in passing over; and anyone, after focussing and marking any near object (say a window), will, in slowly turning (or dropping) the shutter, see the window sideways move along, consequently not improving the sharpness. I would call your readers' attention to this, hoping some of them will give their experience. What is rather peculiar: Once, in exposing on a sailing-boat on a pond, the boat was perfectly sharp in front or bow; and at the stern the rippling water was distinctly seen through the boat. Occasionally the picture has been sharp all over. Can anyone say why? Two discs running opposite ways, one behind the other, and concentric arrangement, will give an exposure opening from the centre, and closing in the centre, that is, if an arrangement be found to make them pass the centre of the lens at the same moment, or two sides fixed in same manner, yet very difficult to do. Meanwhile, as so many of the single drop have been sold, will some of "Ours" state their experiences, without, however, giving any makers' names.

A. H. B.

Proceedings of Societies.

Glasgow Photographic Association.

The second Popular Evening of the session was held in the City Commercial Hall on Thursday, 17th inst.

Mr. T. S. Swan (from Messrs. George Mason and Company) showed through the lantern a number of photo-micrographic transparencies. The pictures were wholly produced by artificial light, the photogene lamp being used for the production of the negatives, and a powerful oxy-hydrogen light for the transparencies. The pictures were taken on wet collodion plates, dry plates having been found to work unsatisfactorily on account of their density. The negatives were taken by Mr. Adolf Schulze, Glasgow, and the subjects embraced vegetable, anatomical, entomological, and diatomaceal specimens. A picture of 165 carefully arranged diatoms excited considerable interest from the fact that the space occupied by the diatoms when taken did not occupy more than a pin's-head. This is the first time such an exhibition has been given in Glasgow.

An interval followed, during which some amateur members gave selections of vocal and instrumental music, after which Mr. Swan exhibited a series of views in Ireland, commencing with the Giant's Causeway, going to South and West of Ireland, showing the ancient and architectural beauties of the district, and terminating at Dublin.

A number of transparencies taken by Messrs. Paton, Leask, and other artists were thereafter shown, the subjects being instantaneous views of animals and steamers, &c., in motion.

Mr. Swan's description of the various pictures was given in an able and humorous manner, frequently obtaining the applause of a large and enthusiastic audience, and gave entire satisfaction.

The evening closed with a vote of thanks to Mr. Swan.

Manchester Photographic Society.

The usual meeting took place on Thursday, the 10th inst., Mr. Alfred Brothers, F.R.A.S. (president) in the chair.

The minutes of the last meeting were read and passed, and the following gentlemen elected members of the Society:—Messrs. Charles Oldham, A Reston, M. Cooper, John Bathe, and Dr. Bahin.

Mr. W. Wright collected portraits from some of the members for the Society's album.

Mr. W. J. Chadwick (hon. secretary) said he had a little paper to read on lantern matters, and a reply to a letter "Pro Bono Publico" (see page 86).

Mr. W. Broughton read a paper on the "Etho-Oxygen Lime Light" (see page 94), and exhibited the apparatus at work later in the evening.

Mr. Robinson exhibited a camera contrived by the Rev. Mr. Faulding and himself for the lantern. It consisted of a framework fixed in the lantern with a movable slide with changeable carriers for various sized slides.

Mr. John Schofield exhibited a print, and Messrs. Benson and Chadwick some enlargements, on Messrs. Morgan's Argentic Bromide Paper. Those exhibited by Mr. Chadwick on behalf of Messrs. Morgan were much admired. One of these was sent by Messrs. Morgan as a presentation to the Society's album, and for which a special vote of thanks was awarded to the donors.

Mr. Lyttle exhibited some instantaneous views and others on Wratten and Wainwright's plates.

Mr. Chadwick exhibited a series of instantaneous views of Messrs. Marsh Brothers, "The Swan," "Flying Dutchman," &c., &c.

The members then retired to the lantern room, where Mr. Broughton exhibited his automatic apparatus at work, and gave a very good exhibition of members' slides.

A vote of thanks was passed to all the members who had contributed to the interesting meeting.

Talk in the Studio.

South London Photographic Society.—The next monthly meeting of this Society will take place on Thursday, March 3rd, at 8 p.m., in the House of the Society of Arts, Adelphi. Mr. E. Dunmore will read an addenda to his paper, "Our Artistic Competition," and other matters of interest be brought before the meeting.

To Correspondents.

H. F. R.—1. The lens you mention is well suited for use with the magic lantern. No alteration or adjustment of the lens is required, it being merely necessary to solder a suitable flange on the nose of the lantern, care being taken that a position is selected which is suited to the focus of the lens. 2. If you unscrew the back combination, and make use of the front lens, with the stop behind it, you will be enabled to obtain excellent landscapes. In this case, however, there will be a slight "pincushion" distortion, which can be changed into "barrel-shaped" distortion by reversing the whole apparatus, so as to bring the stop next the landscape, and the convex side of the lens next the image. This latter arrangement amounts to the same thing as the landscape lens as usually sold.

Inquirer.—Certainly not.

Capt. Turton.—We have seen a superannuated gibus hat pressed into service for the purpose you refer to (this being buttoned on the front of camera); but, in the absence of such an article, something might, perhaps, be done with an accordion bellows strutted with slips of wood.

Ampho.—1. It is best to varnish them; but care must be taken that the coating is even and free from waves. 2. Mr. Wilmor has made some interesting experiments regarding this matter, and his results are embodied in a paper which appears in our present issue.

G. H. P. Jones —1. It is probable that a large portion of the silver originally present in your bath has been removed by use. Try adding ten grains of fresh nitrate to each ounce of the solution. 2. Any dealer in lamps will obtain a duplex or triplex burner for you, and it would be best for you to have one adapted for wicks about two inches wide. You can then make the body to fit your lantern.

A Constant Reader.—1. The use of them is very rapidly extending in the county you refer to, but at the present time a large proportion are imported. 2. See articles in the current Year-Book.

Venator.—Try filtering through Swedish filtering paper. You must not lose sight of the fact that any variation which renders the bromide more prone to subside, also serves to render it less perfectly adapted to the required end. The proportion mentioned by you should give an excellent result.

P. R. J.—No second treatment with hyposulphite is required in the case you mention, although after silver intensification it is well to use the hyposulphite bath.

Mc. L.—You might try immersion of the carefully cleansed article in a solution of one part of sulphate of copper in twenty of water. After this it should be subjected to a careful washing.

E. Day and Sons.—Thank you for the pictures; the soft snow slope, with the bourne running at its foot, is very pretty.

J. A. B.—Three grains bromide of potassium, ten ounces of water.

T. L. Tylor.—To a five-grain solution of silver nitrate, add small lumps of potassium cyanide until the precipitate first formed redissolves; mix this solution with whiting to the consistency of a cream, and rub this on the copper plate. A ten by eight plate may be silvered by this method in five minutes, but the film is extremely thin, although quite effectual in preventing the adhesion of the electrolytic copper which is to be deposited thereon.

Landscapist.—Thin porcelain tea-cups will generally stand the sudden application of heat well, and they are usually less subject to be acted on by chemical solutions than ordinary qualities of glass.

M. N. Pinner.—The light in question is very brilliant, and intensily actinic, but probably the poisonous nature of the fumes evolved would put its use quite out of the question in the case you refer to. A powerful electric light would no doubt serve your purpose, but its production would involve considerable trouble and expense.

L. Camac.—The Society is not by any means an exclusive one, as it freely opens its doors to any respectable person taking an interest in photographic matters; while a formal ballot serves to provide the members the means of excluding a notoriouly objectionable candidate.

Sam.—(1.) Thin glue to which a small proportion of potassium bichromate has been added will serve your purpose admirably. 2. It is soluble in about seven times its weight of water at a temperature of 50° Fah.

C. B. R (Leicester).—We should like to see a print.

W. May.—The arrangement of the foliage is far too uniformly symmetrical to satisfy an ordinary art critic; and the fact of the tree stumps appearing to rise straight up through the carpet might provoke adverse strictures on your work. Study nature and try to imitate.

M. Venner.—The addition of two drops of water to each ounce of collodion will no doubt prove a remedy.

W. C. H.—1. More pigment is required. 2. A 3½ per cent. bath. 3. Sulphate of barium.

Several Corerspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1174.—*March* 4, 1881.

PATENT OFFICE

CONTENTS.

	PAGE
Increasing the Rapidity of Dry Gelatine Plates	97
The Enamelling of Paper Prints	97
The Wet Collodion Process	98
On the Sensitiveness of Bismuth Oxide	99
Photography In and Out of the Studio	99
By-the-Bye	100
Photography at the Melbourne Exhibition. By J. W. Lindt	101
Notes	101
Topics of the Day	102
French Correspondence. By Leon Vidal	104
The Ferrotype: How it is Made. By W. Heighway	105
On Copying Engravings by Lamplight. By H. Houlgrave	106
Correspondence	107
Proceedings of Societies	108
Talk in the Studio	108
To Correspondents	108

INCREASING THE RAPIDITY OF DRY GELATINE PLATES.

It is now sufficiently well known that an emulsion, which is kept for some time in the wet state, gradually increases in rapidity, and it is the general opinion that this increase of sensitiveness is due to the gradual formation of ammonia. But, notwithstanding all the various and simple means now known for obtaining plates of any required degree of sensitiveness, it too often happens that a whole batch of plates is found on trial to be far slower than was anticipated.

The annoyance of such a discovery, after the tedious process of preparing the plates has been gone through, would naturally lead one to investigate the possibility of improving slow plates, even when quite dry; and the influence of ammonia in increasing rapidity would as naturally suggest its use for that purpose.

Experiments which we have made in this direction have given results which prove conclusively that even the dried films may be often much improved by subjecting them to the influence of weak ammonia solution. Having, for instance, immersed one half of a gelatino-bromide dry plate in a dilute solution of ammonia, the entire plate was exposed in the camera before drying. On development, the image on the immersed half appeared sooner, and showed more detail, and was in every respect better than that upon the dry half. It is only fair to state that the exposure was purposely made too short, but the conclusion is obvious, nevertheless. The same improvement was also manifest when plates were immersed in a weak ammonia bath, and thoroughly dried for some days in a drying-closet. Evidently, therefore, the effect is not due to the actual presence of ammonia, but to the alteration which the ammonia bath was enabled to effect in the physical condition of the silver bromide.

Here, then, we have indications of a method whereby a batch of plates may be improved by very simple and convenient means; all that is necessary being to unpack them, immerse them for a few minutes in a weak ammonia bath, dry them again, and store away for future use.

Unfortunately, however, it appears that the greatest precaution must be observed both as regards the strength of the ammonia bath, as well as the duration of the time of immersion; for we found that, in some cases, fog was produced on development; while in other cases, when very strong ammonia was allowed to act for some time upon the plates, the latter became capable of development without a preliminary exposure to light.

The *rationale* of the action of ammonia in these cases is not difficult to explain. Indeed, by means of a microscope the whole process may be watched. It consists of a solution of silver bromide by the weak ammonia solution, and a redeposition of the same, in a coarser and more sensitive condition, upon evaporation of the ammonia. At the same time the freshly-deposited bromide is cemented again firmly to the film, owing to the fact that ammonia is capable also of dissolving a minute quantity of gelatine, which binds the precipitated grains of bromide firmly to the film. Neither can we be surprised that an excessive amount of ammonia should produce fog; for evidently the action resembles that which occurs when ammonia is added to the liquid emulsion, in which case fog is known to result from excess.

It will, therefore, be a matter for trial whether a treatment similar to the above may not in many cases be conveniently adopted by those who have experienced disappointment in the finished results of their endeavours to prepare very sensitive plates.

For the guidance of those who may wish to attempt this plan, it may be stated that we found the best results obtained by a bath containing one drachm of concentrated ammonia solution (·880) to an ounce of water. Plates were immersed in this bath for two or three minutes only, then placed horizontally in the drying-cupboard, and thoroughly dried. We found that a 50 per cent. solution of ammonia, under the same conditions, invariably produced fog. It may be mentioned also that the increase of sensitiveness obtained without fog was from half to twice as much again.

◆

THE ENAMELLING OF PAPER PRINTS.

Much difference of opinion exists as to the relative artistic merits of plain or matt surface prints on the one hand, and highly glazed or enamelled pictures on the other hand. It is, however, not our intention to discuss the matter from an esthetical or artistic point of view, but merely to premise that the general public are in most cases willing to pay a higher price for glazed portraits than for plain work; and, under these circumstances, that photographer whose primary view is business has only to measure the extra price obtainable, against the increased labour and cost of production, involved in turning out high gloss pictures.

Passing over the various kinds of rolling and burnishing machines, our present business rests with the surfacing of prints by means of a layer of collodion, this material being cast, as it were, on a surface of glass, so as to retain the lustre and smoothness of the polished surface.

In all processes of this nature, the first point is to so prepare the glass surface as to insure the perfect and complete separation of the finished and dry print from the glass. To attain this end the surface of the glass may be covered with an extremely thin film of wax, or friction with finely-powdered French chalk may be resorted to. Our own experience points to the former as the more uniformly satisfactory method of the two, especially as the labour of re-waxing the glasses after their surfaces have once become thoroughly imbued with the material is very trifling.

The plate which is to be waxed should be made moderately warm by being held before a fire, and one of its surfaces must be well rubbed over with a lump of pure yellow bee's-wax, care being taken that the glass is sufficiently warm to ensure complete fusion of the wax. A piece of flannel is next folded so as to form a flat pad, and with this wiper all excess of wax must be thoroughly removed; after which a final polish is given by means of a second wiper of flannel. It is of the utmost importance that, in the case of new glasses, the waxing should be very perfect, and, to insure this, the whole series of operations should be repeated several times: and the more thoroughly this is done, so much less is the probability of the repellant film becoming removed by the polishing operation. When plates have been used once or twice it is sufficient to warm and rub over with one of the waxing flannels, after which the final polish is given as before directed. A plate which has been properly polished should show no trace of wax to the eye, but on drawing the finger over its surface the presence of a minute trace of wax can be felt, and the track left is quite different in appearance from that left on an unwaxed glass. It may be mentioned that all methods of waxing by means of solutions of wax in ether, benzole, or other solvents, are inferior to the method here recommended, although they are quicker, and, in some other respects, more convenient.

The waxed glass must next be coated with a plain collodion containing about five grains of a tough pyroxyline to each ounce of solvents, and as soon as the collodion has set, the plate is put into a dish of clean water, where it must be allowed to remain until no appearance of greasiness is visible on its removal from the dish.

If the prints to be enamelled are single transfer carbon prints, all that is necessary is to lay each one, face downwards, on its plate, this having been previously flooded with water, and then to establish contact by forcing out the intervening layer of water with a squeegee. The edges of the print are now clamped to the plate by means of pieces of reglet held with American clips, and the plate bearing the print is placed in a warm room to dry. The reglets are next removed, and on lifting one corner of the print by means of the point of a penknife, the picture will readily leave the glass, carrying with it the collodion film.

When, on the other hand, prints on albumenized paper, collotypic pictures, or platinotypes are to be enamelled, a solution of gelatine must be made use of to ensure a sufficient adhesion of the collodion film. In this case the collodionized plate should be soaked in slightly warm water, and should be flooded with a five per cent. solution of gelatine before the print is squeegeed down on the collodion film. It often—or, indeed, generally—happens that the prints must be mounted on cards, without a loss of that brilliancy which results from taking a cast of the glass in collodion, and in order to do this satisfactorily it is necessary that the cards should be attached to the prints before they are stripped from the glass. This circumstance renders it advisable to mask the negatives so that white borders shall exist on the prints themselves; or the borders may be tinted by a process of double printing, and by using suitable tint negatives; any inscription, or the name of the photographer, may be printed in at the same time. After the mounted prints are stripped from the glass, the oversailing paper must be trimmed from round about the card by means of a sharp knife.

A pleasing variation may be made by employing glasses which are partly polished and partly ground, as, for example, a plate with a polished oval centre and ground edges. In such a case the central portion of the enamelled print is lustrous, while the border possesses the matt surface which results from taking a cast of the ground border.

THE WET COLLODION PROCESS.

There are professional photographers who have literally, for the present, washed their hands of the nitrate bath. At the same time, there are gentlemen, thoroughly conservative in their views, who hold what they term "the gelatine craze" in small estimation, and who look with mingled curiosity and contempt on all photo-gelatinous productions. We, for our part, account it prudent, if not wise, to strike a middle course. Without abandoning the old process, with its wonderful possibilities, it is well to master the new method, and to find out for ourselves what are its capabilities. It has been clearly demonstrated that gelatine emulsion may be so modified and manipulated as to render it serviceable for every variety of indoor and outdoor work. But the knowledge of the how, the when, and the where to make use of the new power to the best advantage, is not so readily acquired as some of our fellow-workers may imagine. If the highest ends of photography could be served by exposing and developing a gelatine plate, the merest tyro might blossom forth at once into a full-blown "artist." Happily, it is not so; there are difficulties in the way, something in the methods of exposing and developing the plate which demands technical knowledge, and skill of no mean order. Of course we assume that the aim of the operator is to attain the best possible results with his process, whatever the process may be. Through years of painstaking labour, he may have acquired a perfect mastery of wet collodion, knowledge of its kind not to be lightly thrown away. His reputation has been built upon the old process, and wet collodion, in his hands, has turned out work of which he need never be ashamed. He will say, and possibly not without reason, that "your new-fangled process may be altogether too rapid. My aim in portraiture is to get the average expression of a face with a decent duration of exposure. Your 'snap shots,' pneumatic and electric shutters, are high-pressure photography, and don't suit me," and so on.

High-pressure photography, and dull weather dodging with gelatine plates, implies, we repeat, a very special sort of training, and until that has become a *fait accompli* with the operator, it is unwise to abandon the old lines.

Other arguments in favour of the continued practice of the wet collodion process are that during summer, when the light is good, it is more economical, and the result of an exposure may be more readily ascertained. Add to this that brilliant negatives are more easily obtained on a collodionised plate, and, so far, we have established our plea for the wet process.

There is yet another phase of the question upon which we have not touched. In the hands of an experienced traveller, the old process is absolutely reliable. For lack of knowledge, a traveller may not pin his faith to gelatine plates, more especially if his route lies through tropical regions having a hot, humid atmosphere. True, the paraphernalia to be carried is a burden not lightly borne, but against this is the certainty that each step of the journey will be represented by a series of satisfactory plates. If gelatine plates are carefully exposed, carefully repacked, and retained for development until the traveller reaches a temperable zone, all may be well—may, but it is not certain. Damp may have made such inroads upon his plates as to render them utterly useless; errors in duration of exposure, or the access of fugitive light, would secure an effect alike disastrous.

In conclusion, we may notice that collodion emulsion appears to have almost gone out of the market. It was only the other day that an African traveller, after repeated enquiry, found a single bottle at his disposal. Why this should be, we fail to comprehend, as in our own experience it has been of inestimable value in a hot climate during the wet season, where gelatine must have broken down. There is one drawback to the use of dry collodion plates in any climate, that is, their insensibility as compared with gelative plates. But for all that, we hold that collodion emulsion may be made nearly, if not altogether, as sensitive as wet collodion. It has proved so in our own experience, and the results have been perfectly satisfactory. Moreover, a dry collodion negative may be readily stripped off the glass, and the glass support used again and again without detriment to the negatives.

◆

ON THE SENSITIVENESS OF BISMUTH OXIDE·

The German chemist, Otto, was the first to maintain that bismuth oxide is sensitive to light. He stated that in his collection of chemicals he had some of this compound which was so exceedingly liable to become darker on exposure, that he was obliged to preserve it from the influence of light.* This property was more closely investigated by Schneider, and the first thing he did was to examine whether it might not possibly be due to a small quantity of silver contained in the bismuth, for he had often occasion to observe that the commercial salts of bismuth contained traces of silver. In order to decide the question with complete certainty, whether bismuth oxide perfectly free from silver undergoes any change under the influence of light, he took a few grammes of pure bismuth, and converted it into the chloride by heating in a current of dry chlorine gas. This chloride was then submitted to distillation, so that the slightest trace of silver, if any were present, must have remained behind as silver chloride, which does not evaporate. The pure bismuth chloride was then converted into the oxide by the usual methods.

He now took two equal quantities of this finely-powdered oxide, and sealed them hermetically in a test-tube. The first of these test-tubes he exposed for several days in a well-lighted room near a window; the other he kept in the dark. On comparing the two at the end of a fortnight, a very slight difference was observed between them—the yellow colour of the oxide which had been exposed to light seemed to be a little darker than that of the one which had been kept in the dark; but no actual deepening in the colour could be observed. Schneider concludes, from these experiments: "It seems, therefore, to be proved that pure bismuth oxide, perfectly free from silver, has no sensitiveness to light." (*Journal für Practische Chemie.*)

For ourselves, we are unable to agree in this conclusion. Schneider himself observed a change in the colour of bismuth oxide which had been exposed to the light, although it was a very small one. It rather appears to us that pure bismuth oxide is, in fact, sensitive to light, but only in a very slight degree.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Amateurs and the Gelatine Process—Professor Draper's Photograph of the Nebula—A Photographic Museum—An American Detective Camera.

Amateurs and the Gelatine Process.—There is one important outcome from the gelatine process from which much may be expected. We refer to the increased interest which should be created in photography on the part of amateurs. The enthusiasm which distinguished the large body of amateurs twenty years ago has passed away. The youthful dabblers in the art have become staid paterfamilias with a disinclination to blacken their fingers, with little spare cash and time to devote to the making of photographs, and with muscles not quite so willing as of yore to be cumbered with a hundredweight or so of material in the shape of tent, camera, or chemicals, and the interest in photography has not descended to their sons. There is now a much greater difference between amateur and professional work than there was a quarter of a century ago. Then, ingenuity and "make-shifts" were constantly called into play, and the amateur in these respects often excelled the professional. Now-a-days the ceaseless activity of manufacturers has overcome every mechanical difficulty, and the matter has resolved itself into one of money. When contrivances of every possible kind can be purchased, who will trouble to make them for oneself? Photography, therefore, has become more and more a speciality for the wealthy amateur. And to some extent, the excellence of the work which the practice of years has brought, has acted as a check to amateur efforts. The "make-shift" attempt of amateurs in the way of glass positives, or negatives with skies of white paper and shadows of ink, at least compared favourably with professional work. Now, save in a few notable instances, amateurs have long since been distanced, and the time and study necessary to produce really good results cannot be given by them. The want of a studio also was always an insuperable difficulty in regard to portraiture, and the amateur perforce was driven to devote himself to landscape work. This either involved the wet process, with aching limbs and no end of "spills," or some one of the dry processes, with much time, trouble, and uncertainty in the preparation of the plates. In either case there were drawbacks, and the consequence is, that of late years the ranks of amateurs have become smaller and smaller. But with the possibility of purchasing ready sensitised plates at a small cost should come a renewed interest in photography. All the disagreeables which used formerly to attend the practice have passed away. There is no tiresome bath to get out of order; nitrate of silver, which *would* stain table-cloths, napkins, books, carpets, and even penetrate into the bed rooms, is abolished; there are no plates to clean, and no collodion to upset and require a week's setting before fit for use again. The amateur may even try his hand at portraiture. Studios, when the gelatine process is used, may be dispensed with, and as there is no nitrate of silver to drop from the dark slide on to the carpet, the most careful housewife will raise no objection. Of course, it will take some time before the outside public, ignorant of photography, and knowing nothing of the important stride which has been made during the last two years, will fully realise the fact that a fascinating amusement has been placed within their reach; but this knowledge will come sooner or later, and when it does, so much the better for the manufacturers of apparatus and gelatine plates.

Professor Draper's Photograph of the Nebulæ.—Very recently we alluded to the exhibition, before the Royal Astronomical Society, of Professor Draper's photographs of the nebula in Orion. Since then Professor Draper has himself described his method of working; and details have appeared in the "Proceedings of the National Academy of Science, New York." Professor Draper used a triple achromatic objective of eleven inches aperture, made by Clark and Sons, according to the plan of Mr. Rutherfurd, for correcting the rays, especially for photography. This telescope was mounted on an equatorial stand, and driven by a clock of the Professor's own construction. The plates used were gelatino-bromide, and were about eight times as sensitive as wet collodion. The exposure was an hour. As to the picture itself, the nebula was very distinct in its bright portions. The stars of the Trapezium, and some others, were so greatly over-exposed, that under the magnifying power employed, they assumed a large size, partly from atmospheric tremor, and partly from other causes. "It is probable," adds Professor Draper, "that much more of the nebula will be obtained in pictures taken in the clear winter weather. This photograph was made at the end of September, when there was some fog in the air; but, nevertheless, the original shows traces of the outlying streamers seen in the drawings of other observers. A series of photographs, taken at various times of the winter season, and in different years, will give us the means of determining, with some precision, what changes, if any, are taking place in this body."

A Photographic Museum.—In the course of his paper on sensitometers, Mr. Warnerke threw out a suggestion which is worthy of consideration. He spoke of depositing his designs in the archives of the Photographic Club for reference, a suggestion to which Mr. Bolas afterwards took exception, on the ground that the Photographic Club, excellent though it was, could not be considered as a permanent institution. When one remembers the endless variety of formulæ which bridge over the space between the bituminous photographs of Niepce and the latest phase of the gelatine process, it must be confessed that a collection of examples of each and all would be intensely interesting. A complete gallery would of course be impossible; but there must be any number of curious specimens and results of long-forgotten experiments which, could they be got together for reference, would prove highly useful and instructive. It is a misfortune that all the photographic societies are simply tenants at will. They have no permanent abodes, and a museum of photographic curiosities is at present unattainable. It may not, however, be impossible. The success of the technical meetings of the South London Photographic Society shows that much interest is taken in such matters, and could a nucleus of a permanent museum be formed, doubtless it would soon be added to. Perhaps the most formidable objection would be found in the fact that the exhibition would be an exhibition, to a certain extent, of failures, and sensitive minds might not like to run the ordeal of criticism. But it should not be forgotten that success is made up out of failures, and that which has been a failure in the hands of one man may, when another man comes fresh to the subject, be easily perfected. It is asserted, and possibly it may be true, that our American cousins are diligent students of our patent lists, and that many of their inventions have resulted from the perfection of crude ideas which first saw the light in English brains.

---

* See Otto's "Manual of Inorganic Chemistry," vol. iii., p. 712.

An American Detective Camera.—The suggestion made in these columns *apropos* of Mr. Henry Blackburn's lecture upon the possibilities of illustrations in books and newspapers, that the detective camera might well be used by special correspondents, has been quoted with approval by the *New York Daily Graphic.* The *Graphic* adds that for a long time it has had upon its staff reporters who are also artists, and the detective camera has been often employed in its service, greatly to the enhancement of the value of its pages, and to the benefit of its patrons. An account of the experience of one of these artist-correspondents would be worth reading.

By-the-Bye.

A FADED CARTE.

We are told there is a lull in the work of professional photographers. Sittings are more rare than they used to be, and orders come in at longer intervals. The public have been photographed, and photographed again, and they are getting satiated with carte portraits, and with cabinet portraits. The family album and the album of notables have lost their interest, and everybody is tired of looking at the portrait of his grandmother on the first page, and at that of the late Grand Duke of Somewhere, on the last. Most of the pictures are soiled, some are faded, and all have an old-fashioned, by-gone appearance that is the reverse of inspiriting; a sameness pervades the whole volume, for one photographic portrait closely resembles another in tone and treatment.

There is much in the plaint that is true; in fact, it is just the elements of truth therein that cause many to believe in the lugubrious state of affairs. To listen to some people, one might imagine that photography is a mere fashion, which came in some years ago, and is now getting into discredit and disuse. Photography is growing vulgar, they would have you believe, and photographers have seen their best days. Every year carte portraits are quoted at a shilling a dozen cheaper, while huge landscapes are now to be had for sixpence each. Is any other proof needed of the decline of photography?

Another reason for the dullness—real or imaginary—that exists in the photographic world, has been given, which is the more serious, since there are grounds for believing that of late years it may have influenced the affairs of portraitists. The reason was given us by a photographer of eminence, residing at one of our great manufacturing centres; it is, that there are not so many people to photograph now-a-days as was the case twenty years ago, and hence, as a matter of course, there is less work for photographers to do. When photography first got within reach of the masses, there were three distinct generations to be photographed: the coming, the passing, and the present. It is not so now. There is only the rising generation to be depicted, and hence only a third of the work to be done. Such a statement is true, in a measure, no doubt; but there are many points upon which it is fallacious. For instance, the photographer of twenty years ago received but few orders for reproductions from old negatives, since he was in possession of but very few; while to-day a business must be worth very little which does not derive a snug little income from commissions given by relatives—or even by the sitter—who prefers to have himself handed down to posterity in the form of an enlargement or enamel, as he was ten or a dozen years ago, before his whiskers lost their ambrosial curl, and the brown locks had not entirely forsaken the crown of his head.

But the question we wish to discuss more particularly is, whether there is any reason at all for supposing that photography will lose the position it has occupied for years past; whether the eyes of the world are likely to look upon the art with less favour than heretofore; whether, because the art was then new and fascinating, it was unduly elevated, and must now sink down to a lower level. There is little doubt people do not make such a fuss about having their portraits taken as formerly, and that the lowest in the land now patronise the photographer as a matter of course. But with all these signs of photography becoming more and more vulgarized, the Upper Ten Thousand do not cease to present themselves before the camera. On the contrary, many of those who have shown themselves inimical to photography have been won over, unable any longer to deny the power and virtues of the subtle art. So that, rather than fall from its present position, photography will, in all probability, rise in the estimation of men. Its ultimate position, so far as the highest attainments of photography are concerned, will, we sincerely believe, rank in time scarcely below the work of our gifted painters; while the essence of truth and reality that exists in a photograph will cause it frequently to be preferred even to the most æsthetic production. Painters in this country, who formerly inveighed against the camera, are now among the most generous patrons of the photographer; while the time may not be far distant when studies made by means of the pencil of light will be permitted to hang side by side in our exhibitions with pictures produced in colour and crayon.

We are acquainted with a gentleman who possesses a series of family portraits. His father, grandfather, and great-grandfather had been painted before him, so there was nothing unusual about getting himself painted into the bargain. A commission was given to an artist of some eminence, and in due course the portrait was finished and exhibited in the Royal Academy, a pretty good proof that the work was tolerably well executed. A place of honour was subsequently found for it in the dining room, and there it was hung to the admiration of all beholders. But the fame of the painting, unlike that of the other family portraits, was very short-lived—not because it was inferior to them, but for another reason. A photograph had been taken of the same gentleman, and enlarged in carbon, and, after a few touches with chalk, sent home. The two pictures, painting and photograph, were then placed side by side, and the family bidden to take their choice. Not a voice was uplifted on behalf of the painting; friends now wondered that they could ever have accepted it as a likeness at all.

The painting was taken down, and the photograph hoisted into its place: and the last time we saw the painted portrait which had once adorned the walls of the Academy, and had cost one hundred-fold the price of the photograph, it was simpering over a lot of disused furniture in a lumber-room.

The photographer, then, may take heart again, if he has lost it. If it is a question of public interest, and of pomp and circumstance, the portrait painter will be called in to do his best; but where simply a true likeness is desired, the photographer will be as indispensable as ever. The painter and the sculptor are among the first to invoke the aid of the camera to furnish them with images of those nearest and dearest to them. Let the votaries of art be ever so hostile to the new-comer, they cannot afford to be without the privileges and advantages the camera confers. They may paint pictures of their children, but they will not the less secure photographs, which will be treasured far more highly; for the painting, let it be executed with all the genius and skill imaginable, must always remain something impersonal. Granted it is a faithful portrait, it is nothing more. The humblest carte-de-visite has attributes that the grand picture in oil lacks altogether. A photograph is a personal *souvenir* of the loved one, as well as a portrait. It is his actual shadow that is here, a shadow that remains to us now the substance has passed away. There is the smile, not the painting of a smile; the parted lips, the bright eyes, the dimpled cheek, the curling hair, are not imitated, but are actual shadows thrown by the true lips, eyes, cheek, and hair, when once upon a time these were presented before the camera.

Nay, we have more than the actual features represented in the photograph. As Miss Thackeray truly says, in words we quoted the other day, there is an essence of personality present that can be produced in no other way. "You see him—himself; the identity is there, the dull worn look, or the familiar cross-grained expression, or the humorous twinkle of the eye, or the little vanities or negligences of dress which always belonged to him." The most valued *souvenir* of any loved friend must be his photograph.

It is, then, because photography can perform prodigies, and beget results far and away above those of other arts, that its aid has become indispensable. We have touched here simply on portraiture, but we might have spoken with almost equal force about the photographing of still life. Photography will not be able to sweep from this world sculpture and painting, and it is equally true that these arts can never affect the progress of photography. Each art fills a sphere of its own; chiselled busts and elaborate paintings attract more admirers than the humble photograph; but ever and anon there comes a time when the little brown print speaks with more eloquence than the broadest canvas and the whitest of marble. It is with the deeper feelings of our nature that photographic portraiture has to do; more sweet memories and tender thoughts are awakened over a photograph than are called up by a score of paintings. The soldier stricken down on the battlefield, the sailor swept from the deck by an angry sea, still live brightly in our memory, kept green by the faded carte that has since become a household treasure; while the emigrant in a far-off land can carry himself back to his native land and the loved circle at home every time he ponders over the portraits in his pocket-book. Photography has entwined itself so closely around our affections that an honourable position is assured to it for ever.

Next week the "At Home" will be "Messrs. Window and Grove at Baker Street." The following "By-the-Bye" will be "On Groups."

PHOTOGRAPHY AT THE MELBOURNE EXHIBITION.

BY J. W. LINDT.

Since last I wrote, a good many new exhibits have been unpacked, and among them several frames and albums of very fine photographs. Feillner, of Bremen, shows, among others, some very fine cabinets. The retouching on these pictures is exceedingly well done; none of the character seems lost, while the refinement that artistic retouching imparts to a photograph is very pleasing. There is also a large album exhibited with a variety of clever fancy dress pictures, panel shape, from Vienna (Austria), representing six or eight photographic establishments. These pictures are mostly very artistic, fully upholding the high reputation of the Austrian photographers. Six landscapes by Herr Johannes, taken among the grand scenery of the Bavarian Alps, rank among the finest specimens of artistic landscape photography in the exhibition. Mr. Stephen Thompson, whom I referred to in my last, has sent in his general remarks about photography to the *Argus*, and I send you by this mail a copy of the supplement, which, no doubt, will be worth reprinting. Mr. Thompson has written a great many of the critiques on art subjects in our exhibition to the leading papers of Victoria, and his opinions are well worth endorsing.

There has been a good deal of work done by the jurors, but as yet nothing definite has transpired. As soon as the official result in photography becomes known, I shall lose no time to send it to you. There is some probability of a presentation album (one copy to each of the various courts) being done. This album is to contain sixty different plates, and probably a short introductory article in letterpress; as soon as it becomes known who is to do it, I shall speak of it more explicitly.

The licensed exhibition photographers have all lost by their speculations. Had there been only one or two reserved licenses, the thing would have borne quite another aspect; but now we have a speculative bookseller, sending a professional canvasser round soliciting orders, making the respectably inclined photographers lose their heads, and lowering the standard of the profession. But as yet none, not even the enterprising bookseller, have made good their expenses.

Notes.

Among the victims of the recent Munich tragedy was one of the principal photographers of the town, Herr Anton Maier. During a costume fête, instituted by the artists of Munich, one of the characters, dressed as an Esquimo, it will be remembered, incautiously approached a light, and his dress, being of matted tow, took fire at once. Four persons were burned to death on the spot, and four others, Herr Maier among them, were so grievously injured that they expired the next day.

Anton Maier, besides enjoying the reputation of being one of the most skilled of Lichtdruck printers, had made his mark as a landscape photographer, his instantaneous pictures of Munich streets and street-life securing him a medal at the Ghent Exhibition last year. Herr Maier's name also stands forth as one of the principal exhibitors at the present Vienna Exhibition.

Four years ago, Government determined to spend £20,000 in the endowment of research among hard-working chemists, physicists, geologists, &c. Four-fifths of the money has been spent, and claims have now been received from all sides to participate in the last £4,000. To satisfy all who have asked for grants, more than ten times the sum would be required, so that there will be some difficulty this year in dividing the amount. Photographic experimentalists appear to have held aloof, although some of our gelatine workers have certainly quite as much right to participate in this public money as many who have already received grants.

Mr. Henry Moore, perhaps the most successful marine painter of the present day, and one of the jurors at the last London Exhibition, thus writes on photography and photographic retouching:—"I am afraid to say for how many years I have taken an interest in it. Suffice it to say, that I still have a few faded old specimens of Calotype or Talbotype, which my brothers and myself executed before collodion was invented; and well can I remember our delight when the first image appeared; and again, when by collodion we first got traces of cloud forms, about 1852. It is easy for any one who can use a brush and colour to stipple all the life and character out of a photograph, but to me, the value of a photograph depends on the amount of success attained without the interference of the *artist* (?) who *works it up*. Spots or accidental blemishes I do not include, but the working out of all the markings which give character to a face entirely destroys its most valuable qualities."

Mr. Bolas' detective camera is likely to find other important applications besides those already referred to. Fitted up in a bank near the paying counters, it may be employed, without delay or fear of detection, in pourtraying the features of doubtful customers. The mere pressure of a key makes the exposure, and takes a portrait of anyone who may happen to be in front of the pay desk at the time. Indeed, by pressing the key four or five times running, four or five portraits may be instantly secured of any very suspicious character. The Bank of France has for years past employed a camera *perdu* in a somewhat similar fashion, but as the manipulations are done by hand, delay and possible detection are elements against its frequent use.

Another possible application of the "detective camera" would be in large factories, workshops, and other establishments, to take note at certain intervals of the aspect of affairs. A clock in connection with the camera would make exposures throughout the day, the series of pictures presenting an exceedingly trustworthy record of the conduct of the establishment. In a word, the camera would act as a mechanical over-looker.

One of the oldest newspapers in existence, if not the most ancient, the *Hamburgische Correspondent*, has reached the hundred and fiftieth year of its age. The proprietors conceived the happy thought of taking a photograph of the original number, published in 1731, and issuing this in the form of a photo-lithograph, by way of a jubilee edition.

Dr. Janssen, at his observatory at Meudon, has considerably distanced the makers of modern instantaneous shutters. In securing his pictures of the sun to show photospheric granulations—or, what might be termed half-tones in the picture—the exposure has to be very rapid, otherwise the image is solarized. Formerly, $\frac{1}{2000}$ of a second was the period chosen, but with gelatine plates a further abbreviation has been necessary. M. Jaussen now affirms that his exposure amounts to no more than $\frac{1}{20000}$ of a second.

Photographically speaking, the Empress of Germany and the Queen of England represent two extremes. The former peremptorily forbids the publication of her portrait, the latter is the most generous of patrons. Last month Her Majesty gave Mr. J. Thomson—Chinese Thomson—a sitting at Osborne, and the result was some good portraits both of the Queen and Princess Beatrice. It was the first time Her Majesty had been depicted by gelatine, and the rapidity of Mr. Thomson's movements was the source of some amusement. The sitting took place in one of the ordinary apartments, but Mr. Thomson's rapid films enabled him to secure five pictures within as many minutes.

Archbishop Whateley once undertook to prove by logic the non-existence of Napoleon Bonaparte. In the same way one might be tempted, after the revelations of late, to avow there is no such thing as light. The photographic image, we know, is not due to anything luminous; you can get a photograph of invisible rays quite as readily as you can of visible rays. Pictures are every day secured of things that the eye never sees. When Mr. Crookes' little "light-mill" was first exhibited, it seemed as if, at last, we had something to show the existence of light; but it proves to be heat only that makes the wheel go round, or "repulsion resulting from radiation," as the author has it. Graham Bell's photophone is another instance. Here we were told that the telegraph wire was replaced by a beam of light, and vibrations carried along by the light could be read like ordinary telegraph signals. But invisible rays are now found to serve for photophonic purposes quite as well as visible ones. In short, we shall have to mistrust our eyes altogether, and believe, notwithstanding that we see it, that there is no such thing as light, after all.

Topics of the Day.

ON INTERIORS WITH GELATINE PLATES.

BY H. MANFIELD.

The gelatine process, thanks to recent improvements, offers so many advantages over wet collodion as a means of rendering interiors, that by this time its employment should have become general; but, unfortunately, a prejudice exists amongst photographers that the negatives are not equal in quality to those made on wet plates, and so the process has scarcely received for this class of work the attention it deserves.

It will be my endeavour to show that this presumed shortcoming as regards interiors arises from the conditions of working not being sufficiently understood, for in careful hands gelatine will give results that equal, and in many cases surpass, those obtained by wet collodion. Success with interior work, on gelatine films, depends very much upon attention to details, and on the quality of the plates employed; more so, I believe, than is generally imagined, for many have an idea that the gelatine film and its development is a very mechanical affair, that all plates are pretty much alike, and their development, merely a number of seconds in a given solution, never varied or modified.

Whilst there are plates in the market that will be found to answer admirably, there are far more that are unsuitable, and only intended for portraiture, most of which have an unpleasant tendency towards "blurring," and often a want of clearness in the shadows, that is fatal to brilliancy. The question of sensitiveness of the plates is an equally important one, for half the failures. I think, in gelatine work may be traced to excessive rapidity; highly sensitive plates have not that latitude possessed by moderately rapid ones, a second, more or less, to an "instantaneous" plate making all the difference between decided over- or under-exposure; and, with interiors, which may require half-an-hour, or even longer, the light is apt to vary so during this period that to calculate the exact time necessary for such films is almost an impossibility. A margin, however, can be given to the moderately rapid plate, which is also capable of standing a prolonged development without fear of fog or stains, and is more under control.

Since the terms "rapid" and "moderately rapid" are relative ones, I may observe that I should consider a plate moderately rapid that is from three to five times more sensitive than landscape wet collodion. It rests with the worker as to whether he will prepare his plates or buy them; if he decides to make them, it is best to select a reliable formula, and make himself master of it. A slight trace of iodide in the emulsion will be found of great advantage in checking any tendency towards blurring, and in keeping the shadows clear; in preparing the plates they should be well coated to form a thick, creamy film when dry.

If it is preferred to purchase the plates rather than make them, it is advisable to obtain samples of several well-known sorts, and select those which give the best results. Plates vary so in different hands that it is impossible to go into the respective merits of even those turned out by the leading makers. But I may observe that the commercial plates with which I have succeeded best contain a trace of iodide and, I believe, albumen; they have a fair latitude in exposure, and possess a singular freedom from blurring.

In taking one's plate from the drying box, or unpacking the purchased ones, they should be examined carefully, and those that are defective set aside. This is especially necessary in the latter case, for alas! manufacturers are far from perfect in this respect, and thin films, or unevenly coated plates, are apt to prove troublesome for interior work. To get over this difficulty, it is a good plan to hold the plates a short distance from the bars of the dark-room window, against the light, and on looking through them, those unsuitable are soon discovered.

I consider all subjects containing strong contrasts, and with windows facing the lens, are rendered with greater brightness and less halation on a thick film than upon a thin one. If two such plates are exposed on a trying subject, and developed together, the thinly-coated plate will be far more "blurred" than the thick film, and if the backs of the plates are examined before fixing, the difference is most perceptible.

For thin films, backing will be found of some benefit, but is unnecessary for a properly prepared gelatine plate. With trying subjects, however, it may prove an advantage, and is worth the slight trouble required in its application. As regards the lighting of interiors, little can be done in this respect, but sunlight is, if possible, best avoided; for the jagged patch of light that travels along the wall or pavement, and comes up in the negative as a white smudge is scarcely artistic or true to nature. Of course there are cases where a streak of sun-light across the floor is a decided improvement; but these are few and far between.

The exposure and development of a gelatine plate require great care, being somewhat dependent upon each other; but whilst errors in the former can be partially overcome by modification of the latter—provided the plates possess some degree of latitude—it should be borne in mind that the exact exposure gives the best results; but with interiors, should there be any uncertainty as to the time required, over-, rather than under-exposure is to be preferred.

It will be found useful to ascertain the exact exposure of a familiar subject with a certain stop and lens (regarding this as a standard), and then mentally comparing its appearance on the ground glass with that of the interior about to be photographed; with a little practice the eye soon detects the difference in the value of the light, and the correct exposure can be arrived at with tolerable certainty.

When time is limited, as it often is when working between services in cathedrals, the following dodge for shortening exposure—practised, I believe, by some of our best workers—may be taken advantage of; it answers admirably, without causing any appreciable difference in the sharpness of the negative, and simply consists, when half the exposure is completed, of removing the stop from the lens, and inserting a larger one, thereby nearly doubling the size of the aperture started with, and thus reducing the exposure one-third.

In the choice of methods of development, that capable of most modification—to suit the exposure and subject—should be chosen, and in this direction alkaline development undoubtedly bears the palm; but whilst there are many formulæ, few of them are thoroughly reliable, and the method now much in vogue for portraiture of mixing two strong solutions, and bringing up the image in a few seconds to printing density, is scarcely to be commended. For interior work much diffused light has to be dealt with, as well as strong lights and deep shadows, and if a plate be developed in the manner alluded to, choked-up lights, or shadows wanting in detail, will generally result, and the process be blamed instead of the method of working it. A slow development consisting of weak pyrogallic and ammonia solutions, with a liberal supply of bromide, gives a very different result; the diffused light, which in the first case would have developed as fog, is now held in check by the bromide, the detail coming up in the shadows, whilst the high lights remain under control. After the bromide has once acted on the film it is surprising how much strong ammonia solution can be added to the developer which, if applied in the first instance, would have produced hopeless fog; but restrained by the bromide, it brings up the detail in the deepest shadows, and more pyrogallic can then be added as required to obtain the necessary density.

Prolonged development will sometimes slightly discolour the negative, in which case the alum bath will be found the best remedy; but the use of sulphite of soda, as described by Mr. H. B. Berkeley in the Year-Book, insures perfect freedom from pyrogallic stains, and is a most valuable addition to alkaline development.

Fog sometimes arises by light being reflected from the insides of lens, mounts, or cameras which may have become brightened by use and require over-hauling—gelatine plates being more sensitive to such defects than wet collodion; the worker will also find that an additional hood, lined with black cloth or velvet, will greatly benefit the working of some lenses, especially those of the portable symmetrical type, which are inadequately fitted in this respect.

In conclusion, I would observe that the advantages of the gelatine plate for interior work may be summed up as follows:—1st. Unlimited power of exposure. 2nd. Great sensitiveness to weak radiations of light. 3rd. Absolute freedom from stains—and that the chief points to be remembered in working the process are the quality of the films, moderate rapidity, and slow development. Dull days, when wet collodion is out of the question, are but little hindrance to the gelatine worker; and even at the present dreary season of the year, when the landscape man is waiting for the spring-time, he may profitably turn his attention to interior work with dry plates, and find much scope for his abilities in our many beautiful cathedrals, ancient mansions, and other equally interesting buildings.

The "Topic" next week will be "Aids to Rapid Printing," by Walter B. Woodbury.

FRENCH CORRESPONDENCE.

Photographic Handbook in the Ministry of Public Works—Is it Light or Heat which Acts on Selenium?—The School of Decorative Arts—Photographic Society at Montpellier—New Shutter of MM. Stebbing and Collin—Photographic Opera Glasses.

Photographic Handbook in the Ministry of Public Works.—The Ministry of Public Works has distributed among the officers and employés connected with the preparation of plans and maps, a hand-book of copying processes which are used in the Department of Bridges and Roads. In this hand-book are well described, not only the method of positive printing on albumenised paper, but also the processes with ferro-prussiate and other papers. A central laboratory has also been established at the Ministry, where foremen can be trained, who, in their turn, will establish workshops for the different printing processes in all the Departments. Thus a new branch of the public service has been created, which will take advantage of all the photographic processes employed in copying. I extract from this hand-book some of the formulæ. The bath recommended for the preparation of *cyanofer* paper is composed of:—

Iron perchloride	10 parts
Citric or tartaric acid	5 ,,
Water	100 ,,

The paper thus prepared is developed by yellow prussiate of potash, which makes Prussian blue with the persalts of iron, but does not alter its colour with the protosalts. Now, the light passing through the transparent parts of the negative, acts upon the coating of the paper above described, and in the presence of an organic acid transforms the persalt into a protosalt. This salt will not be affected by the yellow prussiate, while the persalt, which has remained unchanged under the blacks of the negative, will be transformed into Prussian blue. In this way a copy will be produced in blue lines on a white ground. To prepare the ferro-prussiate paper, it is coated with a mixture of the following solutions:—

1.—Ammonio-citrate of iron	10 parts
Water	100 ,,
2.—Red prussiate of potash	10 parts
Water	60 ,,

The red prussiate of potash is in this case brought directly into contact with the citrate of iron, because it has no action on the latter salt until it has been reduced by light. It is therefore only necessary after exposure to plunge the paper into water, when the whole of the mixture not affected dissolves out, whilst in the places where the light has acted the protosalt is formed, which, by means of the solution of red prussiate, is transformed into Prussian blue. If, therefore, a positive be used with this paper, the ground will be blue, and the lines white. These facts are already well known, but I am so often asked as the formulæ for preparing these papers, that I have thought it better to give a description of those which seem to me good. Both of these papers keep very badly, unless they are preserved in a very dry place. I extract from the same handbook a formulæ for preparing a chromographic paste, which gives very good results:—

Ordinary commercial gelatine	100 grammes
Glycerine	500 ,,
Powdered kaolin	25 ,,
Water	375 ,,

For the kaolin may be substituted sulphate of baryta, and in order to prevent the gelatine from fermenting, a little salycilic acid may be added. The ink to be used is a concentrated solution of aniline violet, called Paris Violet. The means of removing the trace of the old copy from the surface of the paste is very important, because very often much time is lost in effecting this when water at an ordinary temperature is used. It is better to employ water heated to about 40° or 50°C., which must be poured on the surface the same way as developing a photographic plate, and is then drained off at one corner without any kind of rubbing. Another method is to use a rag dipped in water acidulated with ten per cent. of hydrochloric acid; the rag is passed lightly over the surface of the paste, and all trace of moisture is then removed by means of a sheet of blotting-paper. This chromographic method may be applied to photography, in the case of the dusting-on processes; it is, therefore, as well to know the best method of preparing the paste, as well as of removing the former copy before transferring another.

Is it Light or Heat which Acts on Selenium?—A note on the radiophone (as he calls the musical photophone of Professor Bell) by M. Mercadies, read at the meetings of the *Académie des Sciences* of the 6th and 13th Dec., 1880, is liable to lead to some confusion as to the action of light on selenium. It appears from this note that the learned professor attributes the effect produced on the receiving plate to heat, and not to light; hence it has been erroneously deduced that it is heat, and not light which acts on selenium. There are, however, here two different causes which it is as well to distinguish one from the other. In the first place, it is light which acts on the selenium in modifying, in proportion to the differences of its intensity, electrical conduction; but this does not prevent the radiophonic action, properly so called, from being due to the radiations of great wave length—that is, the calorific radiations. The latter, I repeat, very probably are capable of producing alone the acoustic effect; but there is no doubt that, all other things being equal, it is light which acts on selenium quite apart from the heat. If we interpose vessels filled with an absorbent liquid, such as alum, or iodine dissolved in bi-sulphide of carbon (as I have myself done), the effect is not altered, and the needle of the galvanometer marks the same degree either with or without the interposition of the absorbent liquid. M. Mercadies has studied only the radiophonic effects, and their cause, and he has nowhere stated that the modification produced in the internal structure of selenium was an effect of the calorific, rather than of the luminous rays. On this point I am still pursuing my researches with very hopeful results, and I expect that I shall be soon in a position to throw some new light on the cause of the curious phenomena which I have been studying.

The School of Decorative Arts.—The courses of instruction at the National School of Decorative Art are becoming firmly established with the public; the audience is very numerous, indeed as much as it can well be, since numbers have to be turned away at the doors. This shows how public interest in the reproducing processes is increasing, among which photography plays an important part. These lectures, as well as those given by M. Davanne at the Sorbonne, are well calculated to prove what could be done by well organized instruction in photography. This is what the *Chambre Syndicale* proposes in creating a free school for photographic assistants. The project has not yet been carried out, but I believe I am authorised in stating that all students of photography, who wish it, will be admitted to the theoretical courses free. A knowledge of photographic processes cannot be too widely extended, and nothing but good will arise by increasing the taste for them.

Photographic Society at Montpellier.—A society for the study of photography has just been started at Montpellier, under the presidency of M. Margottet, Professor of Chemistry at the Faculty of Science in that town. This is again another centre of research and emulation, tending to promote photographic progress. The inauguration of such a society in a town where science is so greatly cultivated is very hopeful, and I shall take care to follow its progress with interest,

New Shutter of MM. Stebbing and Collin.—M. Collin, in co-operation with M. Stebbing, has produced a camera shutter of the rapid kind, by means of which the duration of the exposure can be varied at pleasure. Moreover, it is so arranged that it can be opened when stopped for any desired time, and finally closed for good. This discontinuous action is effected through a piston working on a cushion of air. The idea is certainly very ingenious, but the model which I saw is too heavy and too expensive. There is no doubt, however, that if the apparatus is a practical one, inventors will soon improve upon it, so as to make it more portable and less costly.

Photographic Opera-glasses.—A few years ago M. Geymet designed a photographic opera-glass by which views could be taken on a small scale, and then enlarged. One of the tubes of this opera-glass acted as a camera, while with the other the object to be reproduced could be focussed. On the outside of the instrument was a sort of shield, forming a circular changing-box to contain fifty plates; these plates were made to fall directly in front of the lens. For long exposures, the apparatus was fixed to a walking-stick which served as camera legs. M. Germeuil-Bonnand has constructed a similar instrument adapted for taking instantaneous views by means of a rapid shutter. I have no doubt that there is a good deal to be done in this line, now that dry sensitive plates are available. The detective camera of Mr. Bolas, it seems to me, could be very happily modified into such an opera-glass, and I think he would be glad to get rid of any appearance which recalls to mind the photographic camera. Nothing, I believe, would meet the object he has in view better than a photographic opera-glass of the kind described above, arranged for instantaneous exposures, and with an automatic focussing arrangement. Leon Vidal.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

V.—Finishing the Picture—Medallions, Vignettes, &c.

Fixing.—The developed plate having been thoroughly washed, it is placed on a dipper and immersed in a bath of potassium cyanide, about half an ounce in ten ounces of water. The exact strength is not a matter of importance, as the operation of fixing is watched; but in this, care is necessary, because the image will be quickly attacked by the potassium cyanide. When the unaltered iodide of the film has been dissolved away, the plate is most thoroughly washed under the tap.

Drying.—The plate is placed on a suitable iron wedge-shaped stand, gently heated by gas, and is here dried It may be dried over an ordinary spirit lamp, or with care over the gas, or fire.

Colouring.—The cheeks, lips, &c., of the picture are now carefully tinted by laying on the dry colours specially prepared for the purpose, with a small camel's-hair pencil, the superfluous colour being dusted off with a blender. Be careful that the brushes are kept dry and soft, as smears from dampness, and scratches from hardness of the brush, will surely spoil the picture. For the cheeks and lips, a little Indian red mixed well with silver white may be used. Further than a suggestion of colour it is, of course, not well to attempt; indeed, there does not seem to be any reason beyond usage why the ferrotype should be tinted. The gilding of jewellery and other artistic exercises of the kind can only please the vulgar.

Varnishing.—A varnish admirably adapted to the ferrotype may be prepared by dissolving fine bleached shellac (perfectly dried first) in absolute alcohol. The shellac, broken up into small pieces, is put into a bottle and shaken up with alcohol. Cork well, and use this as a stock bottle, decanting into the pouring bottle as required. From time to time it may be necessary to thin with absolute alcohol. Keep pouring and stock-bottles well corked, to prevent evaporation as much as possible. Several first-rate varnishes are specially prepared, if the ferrotyper does not care to be troubled with the manufacture himself. The varnish should dry quickly to a hard and glossy surface.

In varnishing, two pouring-bottles should be in use, one from which to pour, the other for the reception of drainings from the plates.

When the plate has been varnished—the operation being similar to that of coating with collodion—and the surplus varnish has been poured back into the bottle, the plate is placed on the oven and thoroughly dried.

Mounting.—The pictures on the sheet of metal are now cut apart. Each one is trimmed round with scissors, the corners notched off, and the picture placed in the ferrotype envelope or card.

Velvet cases, *passe partouts*, frames, &c., in various designs, are sold for the mounting of ferrotypes. Many of these are of very tasteful description, and it is certainly wise for every ferrotype artist to have a good assortment for selection.

Locket Pictures form a considerable and profitable branch of the ferrotyper's business, and no pains should be spared to satisfactorily finish this work in a neat and attractive manner.

To fit a ferrotype picture, the glass of the locket had best he removed and placed in position over the picture. The size of the head should have been specially arranged for the purpose. See to the proper balance of the image before proceeding further, then mark round the glsss with a pin's point, and cut to the scratched line with scissors.

Some Different Styles of Pictures.—Something more than the ordinary plain ferrotype is required to catch the eye of a fanciful *clientelle*, and it is found necessary every now and then to bring forward something a little out of the ordinary way to stimulate the demand for pictures.

Inventive faculty is required for this, and many pleasing changes can be effected in scenic backgrounds and accessories. The pictures in the illustrated papers and magazines will often suggest ideas.

Compositions in which the leading feature has been the rustic fence and gate, or the ivy-shrouded window, rocks on the sea-shore, the bridge over the brook, and a dozen other innocent fancies, have, in their wonderful popularity, shown how richly a little thought will be rewarded.

Two extremely popular pictures, by no means novelties, must not be forgotten—the medallion or oval, and the vignette, both of which are now quite as much sought as at the time of their introduction.

The Medallion.—For this an oval opening is cut in a sheet of stout cardboard of a light grey tint, and fitted to a stand similar in construction to an artist's easel, except that there are two legs behind instead of one. When posing the sitter, the medallion frame must be carefully placed, so that the balance of the figure is perfect. After a little practice, the apparatus can be adjusted with the greatest certainty and rapidity, but some practice is required.

The background to the figure should be dark, a conical background serving the purpose best.

Oval pictures may also be made by having in the camera a suitable oval opening, in which the image on the ground glass is arranged. The outside rim shuts off all light, the result on the developed plate being an oval with a black border. In some cases these ovals are fantastically figured by designs cut out, through which the light strikes on the plate.

We confess to a lack of admiration for this effect, the glaring designs in black-and-white being the reverse of ornamental. But this, of course, is only a matter of opinion; not worth much, perhaps, as an objection.

The Vignette has ever been, and most justly, an important style of portraiture, its tender beauty commending it to every person of taste.

A vignetter is required, and this may be made by cutting from a piece of card, twenty inches square, the segment of a circle dipping five inches, and then cutting notches out of this edge. This board is mounted on a frame, and swung on uprights fixed upon a rod which will fit into a head-rest base. By this arrangement we get two movements: one, by which the vignetter may be raised or lowered to suit the height of the sitter; the other, to secure softness of the serrated edges of the vignetter by slanting the card towards the camera.

In use, the vignetter is placed some distance in front of the sitter, so that it is out of focus entirely, and blotting out all but the head and bust. The toothed-edge of the card is tilted towards the sitter to secure softness in the vignetting, and a white background used.

Grey Vignettes.—For vignettes on a dark ground the vignetting card is tilted the reverse way—*i. e.*, with the serrated edge toward the camera—whereby the card is in shadow. If sufficient depth of tone cannot be obtained to match the background, it must be turned from the light until the desired tone is reached, and harmony with the background secured. Care must be taken to get vignette of good shape, and in arranging the grey vignette especially, there is a chance of destroying this; but, as with the medallion apparatus, practice will overcome the danger. and make easy the use of this useful accessory.

(*To be continued.*)

ON COPYING ENGRAVINGS BY LAMPLIGHT.

BY H. HOULGRAVE.*

My first attempt at copying engravings by lamplight was made with an ordinary tin bracket lamp, furnished with a stamped tin reflector, and a one-inch flat wick. This was placed at two feet from the engraving, and, using a portrait lens of about nine inches focus, and two-and-a-half inches clear aperture, I found that on one of my own slow plates I could obtain a fully-exposed negative in three minutes. Of course, using so large an aperture, the definition at the edges of the picture was faulty; still I considered the result sufficiently satisfactory to lead me to the conclusion that with a more powerful lamp I should be able to employ a stop sufficiently small to secure good definition, without being obliged to prolong the exposure to an inconvenient length of time.

Thinking that a triple-wick magic-lantern lamp would be the most suitable for my purpose I obtained one, and placing it at two feet six inches from my subject, I tried again, using the same lens, but with a stop of only seven-eighths of an inch diameter. This time the sharpness of the picture appeared sufficient, and the length of exposure (seven minutes) not too long; but two other difficulties now cropped up:—1. As the lamp, as a matter of necessity, must be placed at one side of the camera, one side of the subject is nearer to the light than the other, and this near side developed in the negative with much greater density than the side more remote. 2. The illumination was not quite uniform, a well-defined, though faint, shadow being cast by some part of the lamp. In order to overcome the first of these difficulties I had recourse to the tin lamp above alluded to. By placing this at the opposite side, and a few inches nearer to the engraving than the large lamp, I found that it not only relieved the dark side of the picture, but also completely neutralised the objectionable shadow, so that now I had practically a perfect illumination and also a slight reduction in the time of exposure.

Not liking, however, the necessity for using two lamps, it occurred to me that if I had a condenser to collect and concentrate the rays of light, I should be able to remove the lamp to a greater distance from my subject without loss of light, and that this would equalise the illumination. A splendid bull's-eye condenser, six inches diameter, was consequently obtained on trial; but this proved a great disappointment, as I could get nothing with it but a more or less distinct double image of the three flames of the lamp.

Desiring next to ascertain whether an ordinary lamp might not be substituted for the triple-wick magic lantern one, a Hinck's duplex bracket lamp with two one and a-quarter flat wicks was obtained, and with it a silvered glass reflector of eight inches in diameter. The lamp has proved a success, the reflector quite the contrary; for, on projecting the light with it on to a sheet of white cardboard, the disc was found to be full of shadows. A sheet of white paper was then pasted on to a flat sheet of tin, and this I have used ever since. If not very powerful as a reflector, it is at east free from any serious objection; and, if it has no other merit, t has at least this one—that it keeps the glare of the direct rays of light out of the lens, and also out of the eyes of the operator whilst he is arranging his camera.

From what has already been said the following conclusions may be drawn:—1. Two lamps are requisite, but it is not necessary that these should be either of equal power, or that one should be of the magic-lantern type. 2. Neither a condenser nor concave reflector can be usefully employed; but a reflector made by covering a sheet of tin or other flat surface with white paper will be found an advantage.

I now come to the preparation of the engraving for copying. This may be simply pinned to a board; but it can never be rendered quite flat by this means, and it is very desirable that it should be made as flat as possible. A much better plan, when permissible, is the following:—Procure a sheet of glass rather larger than the engraving, and a piece of stout paper about an inch larger each way of the glass. Damp the paper with a sponge, lay the glass upon it, turn over the edges of the paper, and paste them down on to the back of the glass. Now cover the back of the engraving with paste, and carefully mount it on the paper which has just been attached to the glass. When dry, the engraving will be found to be beautifully smooth and in the best possible condition for copying, after which it may be cut from the glass, and will have benefitted rather than otherwise by the treatment to which it has been subjected. Should the engraving form a book illustration which cannot be removed, it may be rendered moderately flat by placing a piece of glass behind it and clipping both together with American clips.

The next point to be considered is the setting up of the apparatus. It is quite essential that the picture to be copied be arranged perfectly square with the camera, or, in other words, at right angles to the axis of the lens, both vertically and horizontally. To effect this object with the least expenditure of time and labour the following simple arrangement will be found very convenient:—Procure a piece of deal board about six feet long and from one inch to one and a-half inch thick. This may be laid across a table or be supported on the backs of two chairs. Upon one end the camera is placed, and at the requisite distance any moderately-large rectangular box or packing case. It will be found a very easy matter to place the camera and box parallel to the board, and the engraving will then only require placing against the end of the box in order to be perfectly true with the camera. The board should not be placed quite horizontal, but should be slightly raised at the camera end, and then the engraving will not require propping up in order to prevent its falling forward. The camera must be raised, if necessary, so that the centre of the lens may be exactly the same height above the board as the centre of the engraving. The lamps may be placed one at each side of the board, and as near to it as they will stand. The distance between the light and the subject to be copied should be from two feet to two feet six inches. If nearer than this there would be a danger of unequal illumination, and if much farther away the exposure required might be inconveniently long.

With regard to lenses; a portrait combination will be found convenient on account of the large amount of light it admits for focussing, as the full aperture may be used whilst performing this operation. In every other respect a lens of the rapid doublet class of eight or ten inches focus will succeed quite as well, if not better. The best stop to use will depend upon the size of plate to be covered and the quality of the definition required at the extreme edges of the picture. With a lens of nine inches equivalent focus, such as I use, I find that a stop of seven-eighths of an inch diameter gives very satisfactory definition up to the extreme edges of a field three inches square. Should a larger picture than this be required, a smaller stop would be necessary; but it must not be forgotten that a very slight decrease in the diameter of the diaphragm would necessitate a very large increase in the time of exposure.

For the class of work we are now considering, the ferrous oxalate will be found by far the most convenient and suitable developer to use, especially for printing the transparencies. It yields pictures, provided the negatives are sufficiently dense, of a fairly good colour, no after-toning being necessary. The following will be found a simple and effective method of mixing this developer:—Place in any glass or porcelain vessel which will not crack with boiling water, one ounce of oxalate of potash, and a quarter of an ounce of oxalate of iron; add four or five ounces of boiling water, and stir with a glass rod till the salts are dissolved; then transfer the mixture to a six-ounce bottle, fill up to the neck with water, and put in the cork. This operation takes scarcely more than five minutes to perform, and the solution will be ready for use in two hours. It will keep in good working order for several days, and may be expected to develop about a dozen quarter plates. But I believe it to be a great mistake to try to get too much out of this developer, as the use of an old solution is sure to lead to uncertainty and disappointment. The most brilliant results will always be secured by using a freshly-prepared solution moderately restrained with bromide. When required for use, pour three or four ounces of the above solution into a white porcelain dish, and add a drachm of a thirty-two-grain-to-the-ounce solution of bromide of potassium. Into this plunge the exposed plate, cover up the dish, and leave for two minutes. If the exposure has been correctly timed, the image will then be fairly out; but the plate must be left in the solution some time longer, as a gelatine picture always loses much in the fixing bath, and it must, in consequence, be considerably over-developed in order to compensate for this. With my own plates, I find that the best results are secured when the exposure has been so timed that the development will be completed in about five minutes. There is little gained by continuing the operation longer than this. Density seems to depend on the length of the exposure, and an under-exposed negative will remain poor and thin, no matter how long it be left in the developing solution.

---

* Read before the Liverpool Amateur Photographic Association.

When the plate is judged to be sufficiently developed it must be washed and fixed in the usual way; but should an iodide enters into the composition of the emulsion with which the plates are prepared the hyposulphate bath must be strong, otherwise fixing will become a tedious business. When this operation is completed the plate must be again washed for two or three minutes in several changes of water, and then plunged for a few seconds into the alum bath recommended by Mr. H. B. Berkeley.

In order to produce satisfactory prints it is quite essential that the negatives be made very dense, and to effect this object resort to mercurial intensification becomes almost a necessity. The method of mixing and using this intensifier which has succeeded best in my hands is the following:—Put fifty grains of bichloride of mercury and two drachms of iodide of potassium into a ten-ounce bottle, fill up with water and shake till the salts are dissolved; allow some little time for the slight excess of iodide of mercury to settle, and the solution will then be ready for use. It will keep in good working condition for any length of time. When required for use pour sufficient of the clear portion into a flat dish, and into this plunge the negative. In about one minute the reaction will be complete, and the plate must then be removed from the dish and washed in three or four changes of water. At this point the negative will have assumed a bright yellow colour, and it must now be plunged into a weak solution of hyposulphite of soda, when this yellow colour will almost instantly disappear. The plate should then be immediately removed and well washed. A suitable hyposulphate bath for the above purpose may be made by diluting a portion of the fixing bath with an equal bulk of water.

The printing of the transparencies must be done in the ordinary way. Two feet from an ordinary gas flame will be found a good distance at which to place the printing-frame. The exposure, of course, will vary with circumstances. In my case it ranges from one to three seconds, the best results being obtained when the negative is sufficiently dense to necessitate the longer time.

The development is exactly the same as for negatives, except that there is not the same necessity for using a freshly-prepared developing solution in this latter case that there is in the former one.

Correspondence.

THE MALVERN PORTRAIT.

Sir,—From the enquiries of stockdealers and others I find a misapprehension exists among photographers respecting the use of the title "The Malvern Portrait." Not only are photographers at liberty to use that title, but it is absolutely necessary that it should be used in connection with that size mount, as calling it by any other name, or no name at all, only leads to endless confusion on the part of the customers who like the size, but do not know what to ask for, and, in a minor degree, on the part of the photographer when ordering mounts, frames, &c.

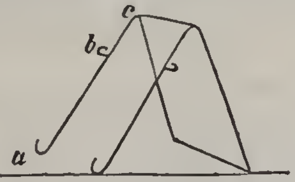
Photographers are at perfect liberty to have printed as I and the majority do, the title "The Malvern Portrait" at the foot of the mounts. The advantages of this course are obvious.

I am pleased to hear this popular size has come more rapidly into use, not only in England and America, but on the Continent, than any size since the advent of the carte-de-visite.—I am, sir, faithfully yours,

Norman May.

BATH STANDS.

Dear Sir.—I have no doubt that many readers of your valuable paper who have long been accustomed to use those clumsy blocks of wood for bath stands will be glad to hear I have devised a light, portable, and strong stand, made of wire (like the diagram I send). *a* indicates loops



to prevent bath from slipping off, and *b* similar ones to secure it at the sides; c the point at which you can fold it for carrying. For those who are accustomed to doing a little mechanical work, it is simple to make one; but if any have difficulty to construct them, I shall be most happy to lend them assistance.—I remain, yours truly,

H. T. Healey.

THE REVERSED IMAGE.

Dear Sir,—In my communication last week to the News on the subject of the reversal of the photographic image, there was an obvious mistake, which, if left uncorrected, might tend to make the process rather expensive. At line 21, page 86, for twenty-five ounces hyposulphite of soda, read twenty-five per cent. Reduced to figures, the developer amounted to two ounces, and the amount of hyposulphite added was half-an-ounce. Again, at line 24, for "close over," read "cloud over."—I am, yours truly,

H. Wilmer.

Sir,—Reversing the image is no doubt interesting from a scientific point of view, but it is not always convenient to get a positive when one wants a negative. If it is of any value, I can certainly bear testimony to the efficacy of hyposulphite in reversing the image, if added in the course of development. This week I desired to secure a fine cloud effect, the sun half dipped in a mass of luminous vapour; although the exposure was as rapid as I could make it, the addition of hyposulphite had the effect of producing clear glass to represent that portion of the solar disc above the horizon, and on printing, I secured a tolerable picture of luminous clouds with a jet black sun setting in their midst. I should have been well satisfied with either a negative or a positive; but one naturally objects to "half-and-half"—at any rate, in pictures.—Faithfully yours, Francis Dann.

INSTANTANEOUS SHUTTERS.

Sir,—In reply to your correspondent "A. E B." I would call his attention to S. P. Jackson's instantaneous shutter, which, I think, practically meets all his requirements. An illustrated notice of this shutter appeared in the Photographic News of November 19th, 1880, and it was stated that the instantaneous views of Messrs. Marsh, including the "Flying Dutchman," the "Final Heat," "Swans," &c., had been taken with it, the exposure in some instances being only the 150th part of a second. The shutter, I perceive by advertisement, is now made for sale in London.

S. R.

[Mr. Fallowfield is the maker of the shutter.—Ed. P.N.]

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held at the Free Library, on Thursday, the 24th ult., the President, Mr. W. H Kirkby, in the chair.

The minutes of the last meeting having been read and confirmed,

The Hon. Sec. read a paper by Mr. H. Houlgrave, "On Copying Engravings by Lamplight" (see page 106).

After some discussion a vote of thanks to Mr. Houlgrave for his interesting paper was proposed and unanimously carried.

A large number of prints. most kindly lent by the South London Photographic Society, were then exhibited, and afforded very great interest and pleasure to a largely-attended meeting. The prints in question were those which had been contributed by the members of the above Society, in various competitions, on subjects previously announced. Among the pictures which were greatly admired were those to which prizes had been awarded, namely, "A Bit of Sunshine," "A Winter Scene," and "Desolate."

The Rev. T. B. Banner, after some remarks on the excellence and artistic character of the pictures, proposed that a prize or prizes be offered for competition for the best picture from one of a set of subjects to be fixed by the Council of the Liverpool Amateur Photographic Association.

This was seconded by Mr. Ellerbeck, and carried unanimously. The subject for the first competition was announced to be "Spring."

The Chairman, having expressed the pleasure which the exhibition of these competitive prints had afforded to himself and to all the members present, proposed a very cordial vote of thanks to the Rev. F. F. Statham, and to the officers and members of the South London Photographic Society, for their kindness in granting the Liverpool Society the privilege of an exhibition of these competitive prints. The resolution was duly seconded, and carried by acclamation.

The Chairman then demonstrated his method of coating gelatine plates, which, he said, was intended more especially for the benefit of the younger members, and would probably contain nothing new to those more experienced. The emulsion, after being melted in a water-bath at a temperature of about 100° Fahr., is filtered through wash-leather, to which is attached a piece of string reaching down into the cup of filtered emulsion, thus preventing the formation of air-bells. This cup also stands in hot water. A cleaned glass plate is now taken on a pneumatic holder, and a ladle full of the emulsion poured on its centre and spread over its surface by means of a bent glass rod. After a little rocking, to render the film even, it is placed on a glass slab, levelled by means of wedges or screws. In a few minutes, when set, it is reared up to dry, either spontaneously or in a drying-box. The ladles used on this occasion were clay tobacco pipes of different sizes, which held the exact amount of emulsion required for each size of plate. By this method, all the plates prepared are exactly alike in thickness of film. After practically illustrating the above, he (the chairman) proceeded to develop a plate printed on by gaslight, using Edwards's glycerine developer, and produced a good transparency suitable for the lantern, being perfectly free from fog.

The exhibits at the meeting were a Stebbing's lamp for the dark-room, by the President; some instantaneous pictures of cattle, by Mr. Roberts; a few negatives taken on plates prepared with the new daylight emulsion, by Dr. Kenyon; some microscopic enlargements on argentic-bromide paper, by Mr. Bruce; a sleeve instantaneous shutter, by Mr. Ellerbeck; and some negatives, by Mr. Day.

The meeting was adjourned to the last Thursday in March.

Bolton Photographic Society.

The February meeting was held at the Baths on the 3rd ult., Mr. Thos. Parkinson in the chair.

The main business of the evening was the furthering of arrangements for intended *soirée.*

Mr. Banks exhibited Mr. Warnercke's actinometer, and also a pair of sensitometers.

A Council Meeting was held on February 22nd, when it was resolved (in consequence of the numerous requests made to the Secretary) to hold the *soirée* during the last week in April, instead of March, as formerly intended.

It was also further resolved that prizes be offered by the Council for competition by the members, particulars of which will be duly announced when arrangements are completed.

Oldham Photographic Society.

The usual monthly meeting took place at the "Hare and Hounds" Inn, Yorkshire Street, Oldham, on Thursday night last, February 24th, Mr. James Wrigley in the chair.

After the minutes of the previous meeting had been passed, the following gentlemen were unanimously elected members:—Messrs. W. Robinson, John Fullalove, and Thomas Fenton.

The members then retired to the lantern room, to witness the exhibition of several views, kindly brought by the Chairman and shown by him; they comprised views of Westminster Abbey, and various interesting views of London, Dublin, and Edinburgh.

Mr. Alfred Knott kindly gave a very interesting explanation of the views.

A number of slides, chiefly gelatine transparencies, were afterwards thrown on the sheet, a pleasant and instructive evening being thus brought to a close by a hearty vote of thanks to the Chairman.

◆

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will be held on Tuesday next, March 8, at the Gallery, 5, Pall Mall East, when a paper on "Art Photography" will be read by Mr. Payne Jennings.

◆

To Correspondents.

P. G. M.—What you ask would necessitate several diagrams and a page of matter. You had better seek for an opportunity of inspecting one.

Carbon.—Soak in alum solution after development.

Hopeful Amateur.—See leader in our present issue.

Carl.—Potassium nitrate is more convenient for the purpose than the salt you mention.

William Shawcross.—You can match the colour with a mixture of indigo, madder lake, and lamp-black; but why not dissolve a little of the pigmented gelatine from the same kind of tissue which you use for making your prints?

C. E. W.—There are no general rules regarding such matters, each exhibition being regulated by a special set of rules.

Photographer.—Ealing, Kingston, and the locality you mention.

D. I. K.—The lens you have been using is well adapted for the work in question, and lenses of a similar character are made by both the English opticians whom you mention. Without careful comparison between the lens you possess and average lenses by the other makers, it is impossible to say whether it is as good. You must remember that a lens of a given description, even when made by a maker of repute, is by no means an absolutely constant quantity. Neither of the three makers you mention will turn out a lens which is below a certain standard, but it often happens that instruments considerably exceed the minimum degree of excellence. A drop shutter, with pneumatic release, will answer your purpose very well. It is impossible for us to give any opinion as to the respective merits of various brands of commercial dry plates; but we are much interested in the results of your experience.

P. P.—Abney's "Instruction" is the better work of the two.

D. H. F.—1. The spots are due to a penetration of silver through pinholes in the varnish. These pinholes probably arise from damp in the film when varnished. 2. We do not know.

W. W.—Probably from Messrs. Rouch and Co., in the course of a few days.

W. M. L.—It is evident that you have been hardly used, but we can only suggest placing the matter in the hands of a solicitor. You can protect yourself in future by not sending payment in advance to strangers.

One Perplexed.—We have never heard of any cases which merited serious consideration.

Carbonist.—1. Under the circumstances you may add three grains of chrome alum to each ounce of your sensitising bath. 2. It is generally a bad plan to hasten the development or to make use of water which is hotter than is necessary. 3. It is quite easy to test the permanency for yourself by partly masking a print and exposing to light for some months.

Experimenter.—1. Excellent results have been obtained by the process you refer to, but few practise it at the present time. 2. A saturated solution of alum.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1175.—*March* 11, 1881.

LIBRARY

CONTENTS.

PAGE
Fox Talbot 109
The Woodburytype Process Popularized 109
The Carbonate of Soda Toning Bath. By Charles West 110
Our Artistic Competition. By Edward Dunmore 110
Two Practical Hints. By Leon Warnerke 111
Photography In and Out of the Studio 112
Notes 113
Topics of the Day 114
The Lime-Light. By T. Frederick Hardwich 115
PAGE
Stray Notes on Gelatine Plates. By E. Brightman 116
Correspondence 117
Proceedings of Societies.—Photographic Society of Great Britain—South London Photographic Society—Edinburgh Photographic Society—Dundee and East of Scotland Photographic Association—Bristol and West of England Amateur Photographic Association—Newcastle-on-Tyne Photographic Association 118
To Correspondents 120

FOX TALBOT.

The photo-engraving of Fox Talbot, which we have much pleasure in presenting to our readers to-day, by way of frontispiece to the present volume, is the work of M. Dujardin, of Paris, from a negative of Mr. Moffatt, of Edinburgh. We need not dwell upon the excellence of the portrait, which speaks eloquently for Mr. Moffatt's taste and skill; and when we mention that the picture has been enlarged from carte size, our readers will at once understand that the task of rendering it by photo-engraving has been beset with grave difficulty; for M. Dujardin's work—good as it is—would have been more readily and efficiently rendered had he been dealing with a direct negative, instead of an enlargement.

Although we have ofttimes recounted in these columns the services of the late Mr. W. H. Fox Talbot, it may not be out of place on this occasion to give an extract from a memoir which appeared in this journal in October, 1877:—

Fox Talbot was the eldest son of Mr. William Davenport Talbot, his mother being a daughter of the Earl of Ilchester. He was born in February, 1800, and received his early education at Harrow. Thence he went to Trinity College, Cambridge, where he gained the Porson Prize in 1820, was Chancellor's Gold Medallist, and graduated in 1821 as Twelfth Wrangler. . . . In the Royal Society's Catalogue alone is a list of about fifty papers by him in various domains of science, and ranging from the year 1822, the year after his graduation, down to 1872. . . In January, 1839, Daguerre published his account of his process. On the 31st of the same month Fox Talbot gave an account of his own process to the Royal Society in a paper entitled "Some Account of the Art of Photogenic Drawing, or the process by which Natural Objects may be made to delineate themselves without the aid of the artist's pencil" (*Roy. Soc. Proc.* 1839; *Phil. Mag.* xiv. 1839); and at the meeting of the British Association that year he read a paper on the subject. From that time onwards he continued to write papers in connection with his invention, though for several years before his death he seems to have lost his interest in the subject, and turned his versatile intellect to other lines of enquiry.

The original photogenic drawing is nothing more nor less than the silver printing process of the present day, which has received little or no modifications since it passed out of his hands, unless it be the application of albumen to the paper, and the fixing with sodium hyposulphite. Early in 1840 a new process due to Talbot created a sensation in scientific circles, the results being a marked advance on everything that up to that time had been produced. This was no other than the Calotype or "beautiful picture process," a patent for which he took out dated 1841. The main features of this process may be described as the production of a photographic picture on sensitized silver iodide, held *in situ* in the pores of paper, and its development by means of gallic acid. The credit of the discovery of this method of development has often been ascribed to Fox Talbot; but we believe that to the Rev. B. J. Reade it is really due, but was so modified by Fox Talbot as to render it manageable in the hands of the operator. The next patent that Fox Talbot took out was registered under the title of "Improvements in Calotype," in which, amongst other things, he included fixing the photographic image on the paper by means of sodium hyposulphite, a solvent for the haloid salts of silver which Sir John Herschel had used in February, 1840.

The third patent taken out by Talbot, in conjunction with Malone, was for the use of unglazed porcelain in lieu of glass, on which to support the photographic image, using an albumen process. In this patent also we have a protection granted for an invention which has several times since been rediscovered, viz., the use of a transparent and flexible support in lieu of glass capable of being adapted to a curved surface, by which means a panoramic view might be taken in the camera by the gradual rotation of the lens round its optical centre. This flexible support was paper rendered transparent and non-absorbent of the liquid albumen applied to its surface. The last novelty included consisted of an application of photography to the production of an image on steel plates, doubtless with a view of helping the engraver.

The fourth patent was for a process (described in the *Athenæum*, December 6th, 1851) by which instantaneous pictures could be taken, and was so sensitive that an experiment undertaken at the Royal Institution to prove its value is worthy of redescription. Printed matter was fixed on a wheel which was caused to revolve at a rapid rate, and being illuminated by the spark from a battery of Leyden jars, a facsimile of it was produced in the camera "every letter being perfectly distinct."

The last patent invention in photography with which Fox, Talbot's name is connected was that of photographic engraving. This process is based on the discovery by Poitevin of the possibility, by exposure to light, of forming an image in gelatine when impregnated with bichromate of potassium. The steel plate on which the etching was to be engraved was covered with a dry layer of thin chromated gelatine, and after exposure in the camera the plate was placed in cold water to remove part of the gelatine and as much of the bichromate as possible. It was then covered with the etching fluid, which penetrated in a greater or less degree through the gelatine film, and the "biting in" thus effected enabled the plate when inked up and printed in the usual manner to give an impression on paper of the subject photographed.

THE WOODBURYTYPE PROCESS POPULARIZED.

The well-known photo-mechanical process which is due to the ingenuity and perseverance of Mr. Woodbury has yielded excellent results in the hands of the few who have carried it out on a commercial scale; but up to the present time only a small number of general photographers or amateurs have worked the method to any extent, this fact being due to a combination of circumstances. In the first place, the hydraulic press and a surfaced steel moulding-plate were an essential part of the necessary plant, and the process of making a gelatine relief involves most of those difficulties which are incident to ordinary carbon printing; these difficulties presenting themselves in an exaggerated degree, owing to the fact that a Woodbury relief is very much thicker than the usual Autotype picture. Moreover, the actual printing from the Woodbury mould demands some of the special skill of the letter-press printer, and few photographers possess the means of effectually rolling that paper which is to receive the impressions.

Certain points must be attended to in the preparation of the tissue, it being of the first importance to select a gelatine which is extremely soluble, but at the same time perfectly free from every trace of putrescence. The product known as Cox's soup gelatine fulfils these conditions in a very satisfactory manner, but other qualities which are a little less soluble—as, for example, the amber gelatine of Messrs. Nelson and Co.—may often be used with advantage. Three parts of gelatine and one part of white sugar, dissolved in ten parts of water, is a good basis for a Woodbury tissue mixture, and one part of indian ink thoroughly incorporated with a thousand parts of this mixture will generally give about the right degree of opacity for ordinary work. As regards the mechanical details involved in the preparation of the tissue, and the production of reliefs, we cannot do better than refer our readers to page 248 of our 24th Vol., where tolerably detailed directions are given. It may be well, however, to mention the circumstance that a proper development of a Woodbury relief requires a considerable time, often as much as twelve or twenty-four hours; it being necessary to continue the action of moderately warm water for a prolonged period, otherwise all fine detail is very liable to considerably suffer.

The relief having been obtained on a piece of plate-glass, the question as to the best method of making the reverse, which is to serve as a printing mould, presents itself. The process of moulding in tin-foil, and then backing up this material with electrolytic copper, is certainly very troublesome, and involves a considerable delay, while fusible metal seldom yields a mould entirely free from defects. The (so-called) Spence metal, however, appears to possess very great advantages for this class of work, and we are gratified to find that our former views as to its suitability for Woodburytype have been abundantly confirmed by the experiments of Mr. Warnerke and others. Not only do we predict a great use for Spence metal, in making moulds for photo-mechanical work in general, as well as for Woodburytype, but we wish here to call attention to a most important fact in connection with the use of this material as a moulding agent by the photo-engraver. It is quite possible to re-mould in Spence metal, that is to say to mould it on itself, it being merely necessary to slightly oil the first mould, to make it very slightly warm, and in pouring fresh material on it to take care that this is not so hot as to incorporate with the matrix. The two surfaces of Spence metal separate with the greatest ease, and the reproduction is as perfect as is possible by any moulding process with which we are acquainted, excepting the electrotype method. The great points, then, in casting Spence metal in Spence metal moulds are these:—1. A thin film of oil; 2. A sufficient warming of the mould to prevent lines of immediate solidification; 3. The use of Spence metal at a temperature tolerably near its solidifying point.

The importance of the above-mentioned remoulding in Spence metal will be obvious to those of our readers who have made a study of photo-mechanical processes. Although Spence metal is sulphur for all practical purposes, it may be noted that the small proportion of a metallic sulphide present in it serves to notably harden it, and also to break up its crystalline texture to a considerable extent.

◆

THE CARBONATE OF SODA TONING BATH.

BY CHARLES WEST.

I HAVE an idea that this bath is being used rather under a delusion, with reference to preparing it, employing it, and throwing it away immediately afterwards as apparently useless. It is the general custom, I believe, to make a new bath every time you wish to tone, to use it within a quarter of an hour, and when you have finished with it to throw it away as useless.

I believe myself that the carbonate bath gives the deepest tone of any, and that by adding *sodium chloride*, NaCl, the tone can not only be deepened, but the bath may be kept for any space of time.

$$2\,AuCl_3 + NaCl + 3Na_2CO_3 = Au_2\,(CO_3)_3 + 6NaCl + NaCl = Au_2\,(CO_3)_3 + 7NaCl.$$

I have tried it myself, and have got excellent results, splendid depth of tone, and I have a bath now that I mixed nearly four months ago, in perfect working order. Of course, when you find your bath failing, add more gold chloride and salts in proportion. The preparation would be this—

Gold chloride	3 grains
Soda carbonate	3 ,,
Common salt	1 grain
Water...	add 1 pint

and should not be used for at least twelve hours after making, or no depth of tone will be obtained.

◆

OUR ARTISTIC COMPETITION.

BY EDWARD DUNMORE.*

ADDENDA.

My last paper was, as my papers generally are, written on the spur of the moment, and to emphasise, as it were, some of the suggestions then hurriedly made is the *raison d'etre* of my communication to-night. Having suggested that our competitions should have a more extended area by permitting non-members of this Society to compete on payment of a small fee, I may say, for the benefit of such non-members, that by a recent rule residents in the country are admitted members of this Society on the nominal payment of 5s. per annum. They can, therefore, not only compete in these trials of artistic strength, but partake also of the many advantages this Society offers to those belonging to it. As regards London members, the subscription is so very low that this should not form a barrier to those who desire to join us; but I am not prepared to say that a payment of 5s. by those who reside within the London area, for permission to become competitors, *without otherwise partaking* in the advantages of this Society, would be inadvisable; in fact, I am inclined to favour the idea, and to advocate that on the payment of 5s. to our Treasurer by any they should be eligible as competitors for twelve months.

Another inducement is now added, and that is the selection of one of the best works exhibited for the presentation prints of this Society, thus giving an emphasis and advertisement to the work of the photographer if it is skilfully and worthily done. (I may also state the presentation print that will be next issued is the charming picture of Mr. Hollyer's, for which he obtained the first medal given by the Society.)

In addition to the titles announced as competition subjects, I would suggest, for the purpose of increasing the educational effect of the scheme, that the name of some common object be also announced, such as a bunch of flowers, a box, a glass of water, &c., &c. Such things are easily within reach of every photographer, and his skill should be exercised in producing a photograph as artistic as possible of it. This would constitute excellent practice and training for greater things; and when it happens to be the case, as it has been since the titles for the regular competitions were announced last month, utterly impossible for landscape men to do anything in the neighbourhood of London towards picture making, they need not be idle, but get themselves into good trim for better or more important work in more favourable weather; a special diploma might be given in recognition of the best work in this channel. I believe Mr. Howard suggested something of the kind when we first inaugurated the scheme, and, as it would provide work in almost any weather and with subjects at hand, it seems a plan that we should be wise to adopt as an accessory to our other more important work.

If by adopting this plan we can induce many more to join us, the extension of our scheme will not only improve the position of this Society, but give an impetus to artistic photography all over the country. It is, however, imperative, that the *art* side of photography be *alone* dealt with, and that *artistic* superiority be the leading quality of the exhibits to be encouraged and rewarded. By so doing the Society resolves itself into an *educational agency*, which is calculated more than anything else to remove the opprobrium so lavishly bestowed on photographs as mere mechanical work, and refute the empty assertions of those not understanding the capabilities of photography who say that by its aid it is impossible to express sentiment or do aught else than slavishly reproduce the work of others. How much we are ourselves to blame for this state of things I will not hazard a guess; but there is no doubt that art in photography has been comparatively at a standstill for many years. I do not think I overstate the mark if I say photographs quite as artistic as those of the present day were done fifteen or twenty years ago, although we have all the extra advantages of rapid plates, improved apparatus, and methods of working infinitely superior to those generally available in earlier days. We get a better finish and more manipulative excellence with greater ease, I will allow, but there we stop.

---

* Read before the South London Photographic Society.

Is it that those engaged in the pursuit of this art listen too much to its detractors, accepting as facts opinions adverse to it, and take for granted that a mere difficulty is an impossibility because it is so persistently asserted? I do not say this is the case, but it seems to me to be the most feasible explanation for the exceeding slowness with which purely artistic photography has advanced, and not from any lack of skill in those who follow it as a profession.

It now remains—Can we do anything to remedy this deficiency? I think we can, and by the means now proposed—by affording an art education in the most *practical* manner possible, the education of competition. Now this is where photography differs from painting and drawing. Competition in these arts would be simply ridiculous unless the competitors had earnestly and thoroughly mastered all the rudimentary knowledge necessary to picture making; but in photography the forms are already there, consequently the *practical* knowledge of drawing is not required, and it only remains to the photographer to select and arrange his materials in accordance with accepted canons of art to make pictures. This is the reason why those whose art education is imperfect are enabled to enter into competition with chance of success and produce artistic work; it must, however, be borne in mind that the better acquaintance the photographer has with art the more likely will he be to succeed. The more interest that is taken in these trials of strength, and the determination with which each competitor tries to outvie the others, undoubtedly tends to improvement of all taking part in them, and each trial should show some advance on previous ones. The greater the number of competitors the greater the interest attached to the competitions, and the more valuable will be the awards.

Photography must not be looked on as a rival to drawing and painting, but as a method of itself by which artistic results may be produced, these competitions partaking, as they do, of somewhat the character of a sweepstake, with this great difference—that whereas the winning a sweepstake depends on luck, winning the South London Photographic Society's medal will depend entirely on the skill and genius of the competitor.

Reverting again to the matter of medals; providing this scheme is cordially supported, and photographers feel sufficiently interested in the welfare of their art to send in numerous works, the funds would be sufficient not only to provide an ordinary medal, but a medal that should be a work of art in itself and struck in gold, such medal to be awarded for the most artistic picture of the year, irrespective of kind. There is, perhaps, a little *apparent* difficulty in the fairness of such an award, many thinking that figure and landscape subjects should be separately classed and awarded; but on due consideration this is *only* an *apparent* and not a real difficulty, as the reward is given for the most *artistic treatment*, no matter what the subject may be. Landscapes can be treated quite as artistically as figure subjects, and *vice versa*. When the pictures are judged by this standard, the difficulty vanishes. Now this is very important to bear in mind, and upon it hinges the usefulness of the whole scheme, and is calculated to bring out the *artistic* qualities of the competitor, and that is the thing desired. Until these competitions were started, no similar attempt had ever been made to cultivate the *inventive and artistic* perception of photographers. Exhibitors, it is true, were rewarded with medals for best work, but this was more for manipulative than artistic excellence; and, I think, if we look over old catalogues or notices of exhibitions, the most purely artistic work will be found left out in the cold—deficient in manipulatory excellence, and, therefore, passed over.

Manipulatory skill is now cultivated to such an extent that rewards for merely this seems somewhat useless, as every photographer, with an average knowledge of his art, can manipulate faultlessly. Perfect work in this respect is looked upon as a matter of course. Now is the time come—since we have perfect mastery over the tools with which we work—to turn our special attention to the results to be attained in an artistic sense, rather than merely demonstrating the capabilities of a lens or superiority of a camera.

Then, again, in accordance with our rules, the pictures have to be made with a *definite intent and purpose*—a plan of all others calculated to exercise the thinking powers and pictorial instincts of the competitors, and to put the capabilities of photography to the most severe test, and out of this trial I feel satisfied it will come triumphantly.

A challenge medal, to be gained three years in succession before it became the property of the holder, might be offered. A medal for the best figure and one for the best landscape, keeping steadily in mind that the special quality of the medal-gaining picture is entirely *centred in the skill shown in illustrating the title given out*, and not for merely good qualities as figure or landscape studies. Four medals would thus be offered, and each one carry considerable weight as affirming the skill of the successful competitor; and would be, I think, an amplitude of medals under any circumstances for any number of competitors.

It now rests entirely in the hands of photographers if this desirable end shall be obtained, and the competitions of the South London Photographic Society made into a grand success. The greater number competing for the prizes, the more valuable will the prizes be; and, if this movement is well supported, by this time another year we may have such an interesting collection of photographs that they will be an attraction to all lovers of the art, and form of themselves an exhibition worthy of this or any other society.

◆

TWO PRACTICAL HINTS.

BY LEON WARNERKE.[*]

In conformity with the invitation of our Secretary, I intend to communicate the results of some experiments that prove useful in my practice, and therefore may be found the same in the hands of others.

About two months ago I prepared some albumen from fresh eggs, and I wanted to keep it from decomposition. I used for this purpose the antiseptic that has just become fashionable—resorcine. I put it simply in a solid condition to the albumen of ten eggs. The instant the crystals touched the solution, coagulation followed, in quantity not much exceeding the volume of the crystals, which subsequently (after a few days) went to the bottom of the bottle. The bottle was a wide-mouthed one, and it was kept open on the table of my library, where the temperature is generally above 62°.

The albumen, after a period of two months, is in perfect condition. It is true that, after about five weeks, green fungi (mould) was formed on the surface. This was removed, and did not appear afterwards. It gave a slight mouldy smell to the albumen, but not that characteristic unbearable smell of rotten eggs (sulphuretted hydrogen). Being thus satisfied that resorcine may be valuable as an antiseptic, I think it will be not uninteresting to make a closer acquaintance of this substance, and therefore I communicate a few extracts in my note-book.

Resorcine is a substance first obtained by Hlasiwitz and Barth, by the action of caustic potash on gum galbanum in the state of fusion; its chemical formula is $C^6H^6O^2$; it is isomeric with pyrocatechine and our old acquaintance hydroquinone.

To prepare it, gum galbanum is first treated with alcohol to eliminate all parts soluble in that menstruum. Subsequently 2½ to 3 parts of caustic potash are added, and the mixture heated till a homogeneous molten mass results. Sulphuric acid with water is added. From 2 to 3 parts of ether are mixed, and all resorcine is dissolved. It is next subjected to evaporation on a water bath; the residue distilled, when resorcine in the shape of crystals is collected. From 30 grammes of gum galbanum, 1 gramme of resorcine is generally obtained. Gums of asafœtida, ammoniacum, extract of the wood of sapan, and paraiodophenol equally furnishes resorcine.

---

[*] Read before the South London Photographic Society.

Resorcine melts at 90°—104° Cent., boils at 270°; it is neutral, has a disagreeable bitter and sweet taste; it is very soluble in water, alcohol, and ether; insoluble in bi-sulphide of carbon and chloroform. It combines with ammonia, and with sulphuric acid. When heated to 195° with phtalic anhydride, it gives fluorescine. Treated with nitric acid, it gives trinitroresorcine, which is far more explosive than picric acid.

An aqueous solution of resorcine with ferric chloride strikes a deep violet colour. A similar colour is obtained with chloride of lime, but more evanescent. It reduces a warm solution of nitrate of silver in presence of ammonia.

It is soluble in fuming sulphuric acid, giving a solution of a yellow orange colour; this becomes darker after some time; after twenty to thirty minutes it becomes green, and subsequently a magnificent blue. When heated to 100° it becomes purplish, and when neutralized with caustic soda, it is carmine red fluorescent.

Naturally, the question may be put, "How will resorcine act on gelatine emulsion?" I have tried it. My emulsion has kept very well for the last two months, but whether this is due to resorcine, or to the cold weather, I am not able to say. More time is necessary to furnish a satisfactory answer to that question. I may say that resorcine is used at present to preserve meat from decomposition during long voyages; for this purpose the space where meat is hung is constantly ventilated with air that has passed through the solution of resorcine.

My next subject is a very perfect and convenient mode of hermetically closing bottles or other vessels containing chemical compounds. The plan consists simply in rapidly dipping the neck of the bottle in molten Spence metal. This valuable compound, previously described by myself, possesses the following valuable properties:—It melts at a low temperature, it solidifies very rapidly, it is not affected by any chemicals (carbon bisulphite excepted). When solid it is extremely hard and brittle. All these properties render it perfectly suitable for the purpose I propose. You observe that among the bottles I submit to your inspection there are many containing extremely volatile and explosive compounds; but, to illustrate the extraordinary capabilities of this method, I show you this test-tube. It was filled with collodion, then the orifice of the tube was covered with cigarette paper stuck to the edges of the tube by moisture; this was rapidly plunged in the Spence metal, and you can observe that, notwithstanding the porous nature of the paper and volatility of the ether, the tube is effectually closed. Opening of the bottles thus sealed is not difficult, thanks to the brittleness of the metal. The Spence metal is a compound of sulphide of iron with sulphur; it can be molten in an ordinary saucepan over a slow fire, only care must be taken not to heat it too much, because it thickens with a high temperature. If by chance this happens, the saucepan must be removed from the fire and cooled until the molten mass becomes perfectly fluid again.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

THE INVENTOR OF PHOTOGRAPHY—HYPOSULPHITE IN THE DRY PLATE DEVELOPER—ACTION OF LIGHT ON ANIMALS—ON THE RELATIVE INTENSITY OF ELECTRIC, MAGNESIUM, AND SUNLIGHT.

The Inventor of Photography.—Who was the inventor of photography? Talbot? No! Daguerre? No! Nièpce? No! Davis? No! Watts? No! Dr. Eder, who is a trustworthy authority, informs us that the inventor was J. H. Schultz, who was, more than a hundred years ago, a professor in Halle. Schultz poured a solution of silver on chalk, and observed that the precipitate he got was darkened by sunlight. That was in the year 1727. He proved that this discolouration was an action of light, and not an action of heat, for he tried the effect of the rays of a hot furnace on the precipitate, and found no discolouration. Further, he exposed the precipitate to sunlight under cut-out characters and words, and he observed that they were copied by the action of light on the precipitate, which darkened at every lighted point. In this way Schultz, indeed, was the first who reproduced words and outlines by light with the aid of silver compound, and, therefore, Dr. Eder says, Schultz is the inventor of photography! He also calls attention to the fact, that Priestley, in his "History and Present State of Discoveries," London, 1772, mentions Schultz's observations, but made some mistakes about the time. Schultz was a medical man, and Professor of the Greek and Arabian languages. The original paper wherein he described his discoveries, in the latter language, was published in the Transactions of the Leopoldine Academy, 1727, and it is very difficult to obtain. This may be the reason, says Eder, that it was never acknowledged, and nearly wholly forgotten. Certainly this discovery has had no consequence at all; it was made so early, that is to say, before the scientific world was prepared for it. About the same thing is true with regard to the discovery of America. Who first discovered America? Columbus? No! The Normans reached the new Continent first; they visited the Bay of New York—even the land now called Florida—a long time before Columbus; but the old discoverer's activity was like that of Schultz, without any consequence for the mental and material progress of the world; at the time Columbus's discovery produced a real revelation in geographical knowledge, and awakened the spirit of enterprise in all intelligent communities.

Hyposulphite in the Dry-plate Developer.—In the same issue of the *Photographische Correspondenz* wherein we find Dr. Eder's above-mentioned notice, Wilde and Eder confirm the observation of Captain Abney as regards the action of hyposulphite in the developer; but whilst the latter only observed a favourable action of this salt with bromo-iodized plates, Dr. Eder and Wilde have studied the same action on pure bromide plates. Wilde recommends for three ounces of developer ten to forty drops of a hyposulphite solution, three grains per ounce. Another phase of this question has been studied by Mr. Wilmer, who described his experiments in our issue of the last week but one. This investigator finds that the addition of twenty-five per cent. of strong hyposulphite solution to the oxalate developer, at a certain stage of the process, causes a sudden, and in many cases complete, reversal of the image.

Action of Light on Animals.—Moiesholt and Fubrisi have not only observed that animals in general develop more carbonic acid in the light than in the dark, but they have also measured the quantity, in the case of amphibia, birds, insects, and mammals. All these animals absorb oxygen and form carbonic acid. If the quantity of carbonic acid formed in the dark is 100, the quantity in the light is 120 to 140. The red rays have also a favourable action, but more feeble than the violet rays: the action as measured by the quantity of carbonic acid is 100 in the dark, 128 in red, 139 in the blue, and 142 in white rays, when birds are experimented on.

On the Relative Intensity of Electric, Magnesium, and Sunlight.—Numerous observations have been made upon the relative intensity of various artificial lights and of sunlight, but they seem to us not quite in good accord with each other. Bunsen and Roscoe have observed that the chemical intensity of direct sunlight in an elevation of 22° over the horizon is about 36·6 times as much as that of burning magnesium; but in the *Chemical News* we find a notice of Leeds, who has measured the intensity of light by the quantity of iodine liberated by the actinic action on iodide of potassium. In this notice the intensity of sunlight is mentioned as only four-and-a-half times as much as magnesium light. The difference may be perhaps explained by the difference in the elevation of the sun, or in the quantity of magnesium employed. Leeds observed also the relative intensity of electrical and magnesium light. He says the latter is twenty-seven times more feeble than the first. But here also it is the question how much wire was employed, and what was the strength of the electrical current? H. W. Vogel publishes the results of some experiments he made in this direction a year ago. He exposed his photometer to an electric light on the Siemen's system of 800 candle power, at the distance of seven inches, and also in the same way to burning magnesium wire. The result was that it took seven minutes' exposure to electric light to register 18° on the photometer, and that for doing the same with magnesium light he had to burn 238 grammes of magnesium, no matter whether this quantity of wire was quickly or slowly burnt. H. C. Vogel, the astronomer, published some data upon the relative intensity of the different rays of the electric light and of sunlight, as measured by the eye instead of a photometer. The proportional numbers are—

	Wave Length.	Sun.	Electric Light.
Orange	633	232	190
Yellow	600	175	149
Yellow-green ...	555	100	100
Green	512	52	64
Blue-green	486	27	43
Blue	444	11	25
Violet-blue ...	426	10	20

These results confirm the fact that the electric light contains more blue and violet, and less yellow and red, than sunlight.

◆

Notes.

Mr. H. P. Robinson will shortly contribute an illustrated article on landscape photography, in which he will deal with direct sunshine and shadow effects.

Captain Abney, F.R.S., retired this week from service in the Royal Engineers. As many of our readers know, Captain Abney has for some time past held the appointment of Inspector of Science Schools at South Kensington.

Photography grows every day more important as a convenient plan of reproducing engravings and wood-cuts for illustrated newspapers; indeed, there is not a cheap picture paper in London at this moment which does not employ "process" in some form or another. Take any black-and-white picture to a phototype etcher in the city, and he will prepare you a printing-block from it in a couple of days, at the rate of 3½d. or 4d. per square inch, this moderate charge covering three important operations, namely, those of photographing, transferring, and etching. The phototype block is of zinc, and is delivered ready for use in the printing-press. In an early "At Home" we will describe the whole process.

Another case of poisoning by cyanide of potassium is reported from Plymouth. The wife of a photographer named Hooper appears to have secreted a quantity of the noxious drug, and committed suicide by swallowing it. Sulphate of iron, as our readers know, is a good antidote for cyanide, and as it is an emetic as well, it generally induces immediate vomiting on the part of the patient.

The photo-engraving of Fox Talbot we publish this week is a suitable companion picture to the excellent photograph of Daguerre which appears in the Year-Book. It is the custom to connect the name of Nicéphore Niépce with the illustrious pair, and to look upon the invention of photography as being due in the main to this famous trio. Unfortunately, no camera portrait of Niépce is in existence, otherwise we would have spared no pains to present our readers with a copy of it. Like that of Daguerre, the photograph of Fox Talbot is untouched.

Mr. England reduces local intensity upon his gelatine negatives by the partial application of a solution of cyanide of potassium. With a camel-hair brush he moistens the high-light he desires to render less opaque, and then treats the spot with cyanide solution applied with another brush. By regarding the negative as a transparency the while, the action of the reducer can easily be followed and controlled. Sometimes it is a river or glacier that is treated, sometimes the whole of the sky, which is thus made to reveal clouds that before were invisible. Mr. England prefers cyanide solution to perchloride of iron, which, as our readers know, is frequently employed for the same purpose.

The late Constant-Delessert, of Lausanne, one of the most thorough amateurs it has been our good fortune to know, strenuously advocated the use of salted drawing-paper, both white and tinted, for landscape photographs; and at the Paris Exhibition of 1867 he showed several exquisite examples of printing in this way, especially on grey drawing-paper. We were reminded of the circumstance the other day, in visiting the establishment of Messrs. Window and Grove, of Baker Street who successfully employ the same rugged material for their crayon-like portraits.

In the case of the Baker Street firm there is little difficulty in the matter, for, the prints being in carbon, there is no more trouble in transferring to the rough drawing-paper than to any other basis. But it would be a boon to many if plain salted paper, of the description we mention, were purchasable in the market. There cannot be a doubt as to the infinitely better keeping qualities of such paper as compared to albumenized material; while the effect secured in some instances is in rare good taste. "A Woodland Scene in Winter," the bare twigs rendered on a grey ground, and "A Village Street," printed upon a neutral tint, were two of the best examples we remember in M. de Constant's collection. We say nothing of the improvement given thereby to hard negatives.

Mr. Crowe, of Liverpool, is reported to have taken a very distinct photograph of a lightning flash during a thunderstorm some months ago. The camera was planted at a spot near Dingle, and directed to the sky over St. Philemon's Church, in Windsor Street. The flash appeared over the church at the instant the bell-tower was shattered to pieces. It exactly resembles, we are told, the zigzag spark of an induction coil, and is estimated to have been about fifty-one inches broad.

A divided opinion. Tomkins thinks it a capital idea to have a portrait pasted inside his hat. "You can recognise your property at once, even after a jolly good dinner; it's awfully convenient, don't you know." Smithers, on the contrary, has tried the plan, and his experience is against it. "My dear fell'ah, if you had been pulled up as many times as I have through your tile getting knocked off in a street row at night, you wouldn't say so. Why, it used to be a regular thing with me for a bobby to call in at breakfast with my hat in one hand, and a summons in the other; I prefer to lose my hats, thank you."

A striking example of the value of photography as a trustworthy copyist is before us. It is a series of twenty closely-written tables of figures—elaborate comparisons between English and French measurements—which have been computed and set down at infinite pains by some hard-working calculator. Of these tables a negative has been taken, and the result is a number of neat little copies, in which it may be taken for granted not a single figure is transposed, nor the least misprint occurs. There is no need here to go through the tedious labour of checking. One has unbounded confidence in the correctness of every individual cipher, without having verified a single one of them.

Topics of the Day.

ON RAPID PRINTING, AND AIDS THERETO.

BY WALTER B. WOODBURY.

This is, *par excellence*, the age of mountains in labour bringing forth mice. No sooner have the public—or, rather, the photographic portion of the same—been favoured with an explanation to the effect that photography in natural colours is not *un fait accompli* (although, doubtless, the thousands of readers of local papers will go on believing what they have read, and which is never likely to be contradicted), than we hear of a higher and more extraordinary mountain than ever, viz., that henceforth, for the printing from negatives, light of any kind is no longer necessary. What a boon to fog-bound photographers! However, from M. Leon Vidal's recent communication to the Photographic News, it seems this mouse has ventured from its hole, and we there learn that the wonderful new process without light, is comprised in printing very rapidly by artificial light on a gelatino-bromide of silver prepared paper, such or similar to what has already for some time been advertised in our photographic journals as a marketable article.

The M. Liebard alluded to in the above-mentioned article is doubtless a mis-print for M. Liébert, the celebrated author of *Photographie en Amerique*, who has always shown himself a pioneer in the introduction of photographic novelties. Now, without in any way wishing to depreciate the system of M. Christian, which may have some novelty of which we have so far not been made aware, I can only say that it seems there has been too "much ado about nothing" to warrant the flutter caused among the photographic profession.

But the bringing forward before the public the fact that prints can be produced at a rapid rate, and without ever, or "hardly ever," using light, may cause those whose work is almost suspended to see if there is no other means available than they already employ. It is for this reason that I am writing the present article, in which I propose to describe a system of rapid printing that I was on the point of inaugurating as far back as the year 1864, but which was put on one side by the advent of what I considered of greater importance. I allude to the process which bears my name, and which had its birth during that year. Gelatino-bromide of silver was hardly thought of in those days, though Mr. H. P. Robinson reminded me, the other day, that I had prophesied many years ago that gelatine would some day form the principal article in use in our art. Our only means of producing rapid prints at that time was by the aid of a process analogous to the Talbotype—viz., by means of an iodized or bromo-iodized paper, and a gallic or pyrogallic developer, which, from its rapidity, found some favour for enlarging purposes, as being the only system then adaptable in our almost sunless clime. I may mention, in favour of our nearly defunct friend, that I have still by me many specimens produced in that manner by limelight some sixteen years ago, and in no one instance can I detect any trace of fading, the prints being quite as brilliant as platinotype prints. The late Mr. Sutton was a great advocate for printing by development, and if it had had more attention beyond its capacities for producing enlargements, it might have come more into favour and had a longer life. Among the various formulæ I may mention that one I used, and which was published in the Year-Book for 1865, and of which the following is a copy:—

"*Iodizing.*—The iodizing solution should be prepared as follows:—Iodide of potassium, 6 drachms; bromide of potassium, 2 drachms; chloride of ammonium, 1 drachm; water, 1 pint. The chloride gives the paper an agreeable tone, not to be obtained by the other salts alone. If too much be added, the tendency to stain during development will be much increased. The paper should be floated on this solution for three or four minutes to each sheet, the thick drawing-papers five or six minutes, and the solution may be employed until too low in the dish for further use. When dry, the paper should be stored in a folio until required for use.

"*Exciting.*—The sensitizing solution should be prepared as follows:—Nitrate of silver, ½ an ounce; distilled water, 4 ounces; acetic acid, 4 drops; more than this quantity need not be mixed, as fifteen or twenty sheets may be sensitized by it. For sensitizing the paper, a sheet of plate glass half an inch smaller each way than the paper must be placed on four small blocks of wood, to raise it about an inch from the table; the paper should be laid on this, so that the edges project a little over each side of the glass, and then brushed softly over with the silver solution by means of a long strip of swans-down cotton folded in three or four folds, fastened over a slip of glass the same width, and held in its place by an india-rubber ring. A small quantity of the silver solution should be filtered into a small plate, and the swans-down dipped into it and swept over the paper, beginning at one side, and re-dipping every time. It should then be gone over with the brush in an opposite direction. By looking along the paper at the reflection of the window, it will be seen if evenly covered, and can then be remedied before it is too late. It should now be pinned up in its position and exposed wet, the picture having been already focussed and the light properly arranged. It will be found advisable to hold a pin in the hand that lifts up the corner of the paper; that corner can then be pinned up at once, leaving that hand free to use another pin for the opposite corner.

"*Exposure.*—The exposure can hardly be given, some papers being done in a quarter the time of others, difference in distance from the lens and density of negative also affecting so much the time of exposure.

"At this time of the year (winter) for a soft negative (such as will also give a good print on albumenized paper), enlarged from 1¼ inch to life size, a minute to two minutes will suffice; the appearance of the faint image on the paper will also be a good guide.

"If a dense negative, the dark parts should be clearly discernible; if a thin one, the faintest trace on the paper shows that it has been sufficiently exposed, though a little under- or over-exposure is not of much consequence, as it can be rectified in the development.

"*Development.*—Nearly every method of development, such as making a tray of the paper, &c., but all more or less produce stains if the paper touches anything during development. The way I have found the most successful is to take the paper and pin the two top corners to the edge of a table, letting it hang down, and taking hold of the bottom corners and drawing it out at an angle to pour from the top of the sheet in one sweep the filtered saturated solution of gallic acid; this runs down and covers the whole surface of the paper at once with the developer, very much in the style of developing a collodion negative; a large dish should be placed under the paper to catch the excess of solution. The clean results of this method well repay the extra amount of solution used. The picture must now be carefully watched and taken down as soon as sufficiently developed; they lose little or nothing in the fixing. Two large dishes should be ready, one containing water and the other hyposulphite; the picture should be passed three or four times through the water and then placed in the fixing bath, where it must be allowed to remain until all yellowness has disappeared, which may be seen by holding the paper to the light. During the development of one picture, another sheet may be sensitized and exposed, so that no time may be lost, and by this means, within an hour's sunshine, I have produced as many as fourteen enlargements.

"For sensitizing, a very useful clip of varnished wood, about three inches broad, for holding the cotton, is made by Atkinson, of Liverpool; also another in porcelain well adapted for the purpose.

"During all the operations no more light should be admitted than would be allowed in any dark room, though plenty of yellow light should be used.

"For vignetting, all that is necessary is to cut out a piece of cardboard, an oval of about 2 inches by 1½, and moving it about in front of the lens during exposure, so as just to shade the parts desired to be left white. That there is little that is new in this I am well aware; still, as sunshine at the present time is generally of very short duration, the advantage of a certain and quick process will recommend itself to all."

Another receipt is given by Monckhoven in one of his treatises, and is pretty rapid. The paper is prepared in a solution of:—

Water	12 ounces
Tapioca	1 dram
Iodide of potassium	1 ,,
Bromide of ,, ...	1 ,,

sensitized, when required, by floating on a bath composed of—

Distilled water	10 ounces
Nitrate of silver	5 drams
Citric acid...	20 grains

Nitro-glucose paper was said to give very brilliant and good-toned prints; but I never had an opportunity of testing it. As good tones could, I imagine, be obtained, as with the gelatino-bromide process, and although the latter possesses the advantage of much greater rapidity, the question remains that, for the purpose proposed, is this intense rapidity desirable?

However, whether either this, the gelatino-bromide, or other process, finds the most favour, the only practical way to utilise the rapidity given is by aid of suitable machinery, by which the operations are rendered automatic, and I will therefore give a general idea of the arrangements I had contemplated.

There are two methods to be considered: 1. The printing direct from the negative, the same size by contact; the other, by using a condenser and throwing the image on to the prepared paper, the same size, reduced, or enlarged; for either method the same mechanism will answer, clockwork by spring or weight being of sufficient power to give the necessary different movements, which are as follows:—

1st. A movement similar to that employed in a roller dark slide, where one roller is covered with a length of paper, and the other is gradually made to unroll the paper from it, intervals of a certain length of stoppage being arranged for.

2nd. A movement to press the negative held in a suitable frame against the sensitized paper, which should have a backing of stout felt.

3rd. The uncovering of a shutter in front of the aperture from whence proceeds the source of light, such aperture being regulated by diaphragms ranging in size to suit the sensitiveness of the paper employed or power of light used.

4th. The closing of the shutter.

5th. The removal of the negative from contact with the sensitised paper, or its equivalent, viz., loosening the backing of felt so as to allow the paper to pass freely; and then a repetition of all the above movements.

The whole time occupied by the various motions above described need not occupy more than five or six seconds, supposing the exposure to require two or three seconds, which would be about the time. Supposing that a paraffin lamp was used in the case of gelatino-bromide, and the lime-light for the iodized paper, so that given a constant supply of the sensitive paper (which should be cut in strips the required width, and attached with india-rubber), prints exactly alike could be produced at the rapid rate of 500 or 600 per hour.

The development and fixing could easily be accomplished in the same automatic manner and the same machinery, the length of time in developing the prints being regulated by the length of the bath holding the developer through which the prints would pass during a given time; that is, supposing the developing bath was ten times the length of the print, each print would necessarily remain in the developing solution about one minute.

The intermediate washing and the fixing would necessarily follow in the same automatic fashion.

In the case where the image is (thrown) through the condenser and lens for enlarging or reducing on to the band of paper, a sheet of clear white glass should take the place of the negative in the former system, to keep the paper perfectly flat during exposure.

The "Topic" for next week will be "On the Application of Stereoscopic Photography to the Science of Meteorology," by John Harmer.

◆

THE LIME-LIGHT.

BY T. FREDERICK HARDWICH.*

MR. HARDWICH prefaced his remarks by stating that the best of the nipples for ordinary work was undoubtedly that with an aperture of 1-20th of an inch. It was a larger size than that usually supplied with lanterns, and, said Mr. Hardwich, I adopted it originally on the recommendation of Mr. Cooper, of Northampton, who saw it first, I believe, in Edinburgh. With this orifice to the burner, one and a quarter pounds of chlorate of potash will supply enough gas for an hour and three-quarters; the pressure on the bags being three-quarters cwt., and the oxygen tap turned fully on. The quantity of coal gas used is not much greater than that of the oxygen, but I still adhere to the opinion I originally expressed, that if an extra weight be required on this bag, there is not the slightest danger in putting it on, since the pressure is equal in front of the taps where the gases mix, although unequal on the bags.

The angle at which the flame impinges on the line I do not find to be of the importance I anticipated; indeed, I obtain a most excellent light by doing away with the angle altogether, and shooting the flame along almost parallel to the face of the cylinder. It would not be possible, however, to work in this way, as the point of the jet is so near that you cannot rotate the lime.

On the whole, I am inclined to give the preference to the angle recommended by Mr. Newton, of Fleet Street, London, in the discussion on my paper; viz., as near to a right angle as is possible without throwing a shadow on the condenser—say 45°; the advantage is that the light is somewhat whiter, and the jet can be placed at a greater distance from the lime. With the smaller angle of 17° you obtain a very strong light, bringing out all the details in the shadows of the picture, but there is a tendency to yellowness, which a practiced eye at once detects. I explain this by the fact that the lime spot, although larger, and consequently giving more light as regards quantity, is not so intensely heated; this is shown by its wearing away more slowly under the action of the flame.

Besides being whiter, the wide angle of 50° to 55° has another obvious advantage; it admits of the jet being removed to a greater distance, so that, if the lime should crack, or be improperly centred, it will still rotate without touching the platinum point. About one-eighth of an inch I find to be a good striking distance; but it must be borne in mind that the cylinder expands when heated, and approaches a little nearer to the point.

---

* Read before the Edinburgh Photographic Society.

In the jet sent to me by Mr. Oakley, the lime cylinder is upright; but in some of the older forms, made a few years ago, the lime was inclined towards the condenser. One wonders why this should have been done, as the other plan is more simple and convenient; but I do not find that it makes any appreciable difference in the light, and hence it will not be worth while for those who have the old-fashioned instruments to put themselves to the expense of getting them converted.

I used the expression "*if the lime cylinder should be improperly centred.*" This, I am sorry to say, is often the case, and the attention of the manufacturers ought to be directed to it. Very frequently, too, the hole is so choked up by lime dust, that you lose the centre in boring it afresh; this may be avoided by stringing the cylinders into a chain, as is sometimes done. The bore of the lime is also too large for the pin of the jet in many instances, sufficiently so to make a difference of an eighth of an inch in the distance during rotation. To overcome this, take a piece of straight wire of the same size as the pin, and roll round it a strip of writing paper, about three inches long and half-an-inch wide, then put on the cylinder and transfer it to its proper position on the jet. All this may seem troublesome, but it takes less time to do than to describe, and is a great help in keeping the light steady. A still better plan is to use thin sheet lead instead of paper, and to leave it permanently attached to the pin.

Having examined jets by the best makers, both in London and Birmingham, I can give the following directions for testing:—First, examine whether the jet is *gas tight*; close the orifice of the nipple tightly with the forefinger, and turn off one of the taps, then suck at the other tap, and notice whether the tongue is tightly held for a minute or longer. If it is not, there is a leak somewhere, most probably at the nipple screw, and a small washer must be made of two or three thicknesses of the sheet lead used for wrapping tea. Next try the lime carrying pin, whether it is straight and also vertical; bring the point of it close up to the orifice of the jet, without any lime, and turn it slowly round, you will then see at once whether it is right; if not, it must be straightened, or you will lose in steadiness of light. Lastly, test for smoothness of bore; the absence of this will be shown by a *humming* noise, becoming more pronounced when the hydrogen is in excess; and the cure will be to remove all sharp edges internally, by a proper tool, especially those near to the orifice of the jet.

The flame of the oxyhydrogen burner should be noiseless, and if it is not so there will be a little loss of light. I have read of an experiment in which the nozzle of a fire-engine was carefully polished in the interior; the stream of water came with great force, and was clear and transparent as glass. The inside was then purposely scratched and roughened, the effect of which was that the column of water was now opaque and troubled, and the height to which it rose fifty feet less. Of course the two cases are not precisely analogous, the velocity being so much greater in the latter; but I do not think that sufficient attention is paid to smoothing the bore of these gas jets.

In working with a small angle of 17° or 20°, the lime appears to be heated mostly by the outside of the flame, and a small excess of coal-gas does not interfere; but when the angle is 50° or greater, the two gases must be in exactly the right proportions, and an excess of coal-gas will cause a dark nucleus in the centre of the spot. I find it best to regulate the flow of the gases by looking at the lime itself, rather than at the disc; and as it can be done more easily when the *point* of the flame is visible, I work at the top edge of the lime, and, if the cylinder is too long too admit of this, I cut off the top part with a small fret-saw, such as most schoolboys now possess.

It remains for me, in conclusion, to make a few remarks on the precautions necessary to prevent explosion. At the meeting of the London Photographic Society before referred to, fears were expressed that the use of the oxyhydrogen jet by any except the most experienced operators would be attended with danger. It seems to me that any person accustomed to photography ought to be able to use this jet with safety by observing proper rules; and without such rules even the "safety" jet, so-called, is not free from danger.

First. The two bags should be kept separate, each for its own gas, and both should be emptied after the lecture, the taps being left open. I have been told that in the case of a clergyman, alluded to in the discussion, where the whole apparatus was blown to pieces immediately on applying the light, a bag partly full of oxygen had been sent to be filled with coal gas. If the rule had been followed always to empty the bags, this accident could not have happened, and every chemist knows that the bags last longer when the gases are squeezed out at the expiration of the lecture.

Secondly. A weight once placed on either of the bags should not be removed without first extinguishing the light; the expansion of the gas would be likely to cause a suction of the flame backwards, and cases are reported of an explosion even in the oxygen bag from that cause.

The following experiment has been mentioned to me since I read my last paper. A long oblong box was made, and glazed with windows at the sides; the floor of the box was then strewed with fine *coal dust*, and a pistol shot was fired in the inside. There were two reports—first that of the pistol, and next an explosion of the coal dust, which blew out the glass of the windows. Now, if coal dust will burn so rapidly in *air* under some circumstances as to produce an explosion, how much more may any finely-divided combustible powder be expected to burn in *oxygen*; and we know that old oxygen bags often contain a white powdery substance in considerable quantities.

In my own practice I always look upon the oxygen bag as a source of at least equal danger with the hydrogen; and I appoint a trustworthy person at the commencement of the lecture to watch both bags, and see that no one comes near, either to prick them with pins, or to lean upon them with the elbow. With these precautions I have not had the smallest accident in the course of several years.

Mr. Frederick York, of Notting Hill, London, has lately sent me two samples of chlorate of potash, marked respectively, "commercial," and "pure, at double the price." The only difference I could detect was that the gas from the commercial had a slight smell of chlorine on issuing from the retort, whilst that from the pure had none. The "commercial" gas had no smell after passing through the second purifier containing solution of carbonate of soda. The quantity of the gas was nearly the same in both cases, and the light was the same as far as I could judge. I infer, therefore, that good commercial chlorate of potash is sufficiently pure for lantern work, and that the expense attending repeated recrystallization may be avoided as unnecessary.

STRAY NOTES ON GELATINE PLATES.

BY E. BRIGHTMAN.*

After all that has been written on the subject of gelatine plates during the past two years it may be thought the matter has been well-nigh exhausted, and any further allusion to the subject suggests a repetition of what has been said again and again.

I, however, do not intend to revert to the subject of the preparation of the gelatine plate, which has occupied so large a share of attention, but merely to give the results of a few experiments, and an account of various odd matters, hastily jotted down in odd moments during the past season. I feel that an apology is due to our Association for bringing forward such a jumble of disconnected odds and ends, but knowing that a profitable discussion is often the result of a few simple remarks, I venture for a few minutes to occupy your time, with the hope that our after discussion may be more interesting and profitable than my remarks.

Much doubt has been expressed as to the permanency of gelatine negatives intensified with mercury, all negatives in which mercury has been used being condemned as liable to fade. For my part, I am inclined to think that the charge of fading is unfounded, and consider, on the contrary, that instead of fading there is far more probability of such negatives becoming more and more dense from the action of light on the film during printing.

There are so many methods of intensifying with mercury, that even though some may result in fading, or an increase of density, others may be, and are, as I can show by actual results, not liable to fade or change in any way.

The negative I now pass round was taken in September last, and intensified by immersion, first in bichloride of mercury, and afterwards in a dilute solution of ammonia; one half has been covered with a thick piece of cloth, and the other half fully exposed to daylight, yet no difference whatever is observable between the shielded half and the half exposed to the light. The other negative was intensified in a similar manner, the plate cut in two, one half being kept in a dark drawer, and the other half exposed on a greenhouse shelf to full daylight; on putting the parts together not the slightest difference is observable. From this it appears that some methods, at least, of intensifying with mercury do not cause fading or increase of density.

---

* Read before the Bristol and West of England Amateur Photographic Association.

I am inclined to think that the want of permanence attributed to negatives intensified with mercury arises from the fact that wet plates undoubtedly did change when intensified by the old method of first bleaching with mercury, and afterwards applying pyrogallic and silver; by this method the silver in the film would be converted into chloride of silver, and in the event of only a slight amount of intensification being required, the pyrogallic would be allowed to act for a few seconds only on the surface of the film, leaving underneath a portion of unreduced silver chloride, which on printing would, from the action of the light, become more and more darkened, and at last render the negative totally useless.

Having during the past summer used a number of gelatine plates at the sea-side, and not having the necessary conveniences for developing away from home, the plates, after exposure, were repacked in parcels, and kept from contact with one another by slips of white paper, and secured by bands of the same paper placed across the centre of the plates, and held with twine. On developing the plates, markings corresponding with the paper were found on the film. At first I concluded the paper contained some impurity which, coming in contact with the film, produced the markings in question; on further examination, however, marks were found where the paper had not been in actual contact with the film. At first the matter considerably puzzled me, but after considering the matter and carefully examining the plates, I was led to the conclusion that the white paper, having been for some time exposed to a strong light, was capable of impressing its image on the sensitive film. It is said that if a piece of white paper is exposed to a strong sunlight and at once taken into absolute darkness, it will be found to be faintly luminous. If so, is it not possible, and even probable, that paper so exposed may be sufficiently luminous to impress itself on the highly sensitive gelatine film?

I presume most of our members are acquainted with the phosphoroscope; but, as it may be new to some, I venture to show what I consider a most interesting experiment, as it illustrates in a most striking manner the property possessed by certain substances of absorbing and afterwards emitting luminous rays.

The phosphoroscope consists of a series of small glass tubes, containing the sulphides of calcium, barium, magnesium, and other sulphides. These tubes, as you will observe, are perfectly invisible in the daylight; but I will now expose them to the light of a piece of burning magnesium, and you will observe they will emit a brilliant glow of light of various colours—calcium giving one colour, barium another, magnesium another, and so on.

Now it appears to me as highly probable that other substances besides these sulphides may possess the property of absorbing and afterwards emitting luminous rays; and, again, is it not possible that some substances may possess the power of absorbing the invisible rays of the spectrum, and, although these rays, if afterwards emitted, would not be perceptible to the eye, yet they may have the power of acting on the sensitive film?

Having a great dislike to the use of hyposulphite of soda in the dark room, I have always considered the necessity of fixing before exposure to the light. One of the drawbacks of the gelatine process, in all directions, for the development of gelatine plates, the necessity of fixing before allowing the light to have access to the plate, is strongly insisted upon. I, however, find in practice, that if the developer is washed from the plate, that light has no further action on the film. As a proof of this I produce several negatives, all of which were fixed in full daylight; yet the shadows are, in every case, perfectly clear.

The question as to whether a greater latitude of exposure is admissible with dry plates than with wet is one which has been somewhat disputed. I fully expressed my views on the subject at a previous meeting, but since then have put the matter to a practical test.

In order to do so I availed myself of the simple yet ingenious contrivance, which was, I believe, the idea of Captain Abney, consisting of a small plate of glass divided into a number of small squares, numbered (say) from one to sixteen, number one square being covered with one thickness of tissue paper; number two with two thicknesses; number three with three thicknesses; and so on increasing one thickness with each square.

This little instrument was constructed by Captain Abney for the purpose of testing the relative sensitiveness of various plates, that plate which would give the greater number of tints in a given time and with a given light being the most sensitive.

Thinking the matter over, the idea occurred to me that the same contrivance might be used for deciding the question of latitude of exposure, for it will be evident that the plate which will give an image under the greatest number of thicknesses of paper without over-exposure on the square with a single thickness, is the plate which admits of the greatest latitude of exposure.

Putting the matter thus fairly to the test, I find wet plates decidedly have the advantage. The dry plates tested against the wet were of two different makes, and, contrary to my anticipations, the most sensitive make of dry plates gave the greater latitude of the two; and from the few tests I made, it appeared that the more dense the film, the greater the latitude of exposure admissible.

Correspondence.

GELATINE *VERSUS* COLLODION.

Dear Sir,—In the issue of 25th February of your valuable journal, I find a note from our esteemed colleague Captain Abney, who opposed my opinion that in general the sensitiveness of the best gelatine plates in the market is not more than four times so much as that of a good wet plate. He suggests that either German plates "are far behind English ones," or my "development is at fault, or my wet plates are much more rapid than in the English ones."

In reply to this, I beg to remark that I made my first experiments on the relative sensitiveness of gelatino-bromide with English plates, these being the *instantaneous* plates of Messrs. Wratten and Wainwright, which, I think, are equal to the best in the market. My materials for the wet process are about of the same quality as those employed in England; and for my gelatine work I used normal developers (according to the direction of Wratten, Obernetter, Eder, &c.).

Captain Abney finds by his experiments a rapidity of ten to fifteen times so much as that of a wet plate, and I only find a rapidity of four times so much. The difference, I think, is solved by considering the mode adopted for testing the rapidity employed by Captain Abney and myself.

Captain Abney, if I am informed rightly, tested the sensitiveness of his dry plates only by the Warnerke sensitometer; I tested by taking portrait pictures directly, or with wet and dry plates side by side, under the *moderate* and artistically arranged light used in our best studios here. I am glad to hear that Captain Abney has not only used gaslight, but also daylight for his measurements; but if he has not found much difference in using both lights, I beg to ask, "Has he taken into consideration the colour of his sensitometer screen?" As Mr. Warnerke tells us (Photographic News, 1881, p. 92), his previous sensitometers have a *certain brownish tint*. Daylight transmitted through such a brown material must be changed wholly in its nature; it loses, by the absorption of the screen, much more from his violet and indigo and blue rays than from the red, yellow, and green, and so it will become *more similar to gaslight*. That, according to my opinion, is the reason why by employing such screen, gaslight and daylight do not give much difference. I fear it will be difficult to find for the Warnerke sensitometer a quite neutral coloured substance which will absorb all the different rays in the same, proportion. All the black dyes we have absorb the blue rays more than the yellow ones.

Captain Abney says further: "The gelatino-bromide process is essentially an English one." I have never denied that. "There is one charge that cannot be laid against it, viz., want of rapidity." I have never done that; I have only recorded my results on the rate of rapidity, as did Captain Abney. He also says: "Even our worst enemy will hardly accuse English photographers of entering into a sort of long firm business, which they might do, if plates were issued stating that they were ten, twenty, or thirty times more rapid than wet plates, when they are only four times more so."

I was "more than astonished" to read that. I need not assert that I am not an enemy of England. If Captain Abney will do me the honour to read my writings, he will see how much I acknowledge English investigations. On the other hand, I think the matter in question is not a patriotic or political one, but a *scientific* one, and if scientific men like Captain Abney, Dr. Eder, and myself hold such different views regarding the rapidity of gelatine plates, that the first estimates it ten to fifteen, the second at least six to seven, and myself about four times as much as wet plates, anybody will excuse the dry plate manufacturers if they select from all these numbers the most favourable for their trade notices.[*]—Faithfully yours,

H. W. Vogel.

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly meeting of this Society was held on Tuesday, at 5, Pall Mall East, Mr. J. Glaisher, F.R.S., President, in the chair.

Mr. W. Peek and Mr. C. J. Hill were elected members of the Society.

Mr. Payne Jennings read a paper on the art aspect of photography, contending that although photographers had a right to be called artists, yet in many cases their productions deserved the unfavourable criticism passed on them by artists. He doubted whether photographers were increasing their reputation year by year, and thought that the criticisms which appeared in the photographic journals were, as a rule, far too favourable. In the photographic exhibitions also the hanging committees were too lenient, and he thought they should eliminate all those pictures which did not reach an artistic standard. He suggested the formation of a photographic art council so as to encourage the development of art in connection with photography.

Mr. E. Cocking then read some notes on photographic art, and in so doing pointed out that those who compared the photographer with the painter, and judged them by the same standard, fell into an error. The photographer had to select his subjects, and not create them; the painter, by study and training, made his mechanical means his slaves; the photographer was to a certain extent the slave of his mechanical means, hence they could not be judged from the same standpoint. Photographers too often thought that the possession of a camera which enabled them to produce pictures easily was sufficient, and did not pay attention to the cultivation of art. He thought the time had arrived when an art school for photographers should be established.

Mr. Warnerke differed from Mr. Cocking if he contended that the painter had to depend more upon his brains than did the photographer. He had once been on a photographic excursion with Mr. Payne Jennings, but though they took their pictures from the same point of view, Mr. Jennings' pictures were beautiful, while his were nowhere. In a photographer, as in a painter, there must be a natural genius.

Mr. Jabez Hughes did not agree with Mr. Jennings' condemnation of the exhibitions. It was true that pictures of different standards of merit were shown, but it should be remembered that their annual collections were records of the year's work, and so a useful purpose was served. With regard to editorial criticisms, he thought that they were meant as encouragement, and rightly so, as the photographic journals formed the only source from which encouragement could come. The accuracy of photography had also been overlooked. Accuracy was really its strong point, and while the photographer put truth first and beauty second, the painter put beauty first, and then truth as a means of exhibiting that beauty. Mr. Hughes then proceeded to criticise a copy of one of Mr. Alma Tadema's pictures, which was exhibited on the walls to show that had a photographer committed the same errors he would have been severely condemned. He thought there was a very wide distinction between the painter and the photographer, as the former builds up his picture bit by bit, while the photographer had to seize it as a whole.

Mr. Valentine Blanchard thought that the absence of colour in a photograph was one reason why it would never hope to compete successfully with painting. In going through the exhibition of the Royal Academy, there was the same feeling of disappointment when, after looking at the masses of colour, one turned to the collection in black and white. There was also the drawback of size. Photography could render effects up to a certain point, but beyond that it failed. He was, however, of opinion that the exhibitions of the last ten years showed an immense advance.

Mr. S. Fry thought that art photography had made enormous strides of late years, and instanced the many beautiful photographs which were to be seen in the shop windows. He pointed out that while artists severely criticised photographs, they made large use of them without the slightest acknowledgment, often contenting themselves with simply reproducing the pose and treatment adopted by the photographer.

Captain Brownrigg thought, with Mr. Cocking, that it was a mistake to compare photography and painting. He quite endorsed Mr. Blanchard's remarks as to colour, and contended that there were some subjects which no photographer should ever attempt. He should be contented with such subjects as would show the effect of light and shade, and not those, such as a large expanse of sky, which required colour to represent them.

Colonel Ridgeway, after a few remarks in defence of editorial criticisms, went on to say that the subject would be more easily discussed if it were confined simply to two forms of art—the realistic and the idealistic. Photography must be claimed as belonging to the former, and, therefore, what photographers had to think about was not so much what to attempt, as what to avoid. He thought that photography had now the advantage of mustering in its ranks many men of true artistic feeling; but that if photographers endeavoured to compete with the pencil and with pigment, in idealistic compositions, they would attempt that which was impossible, and bring down hostile criticism.

Mr. Payne Jennings then replied, endorsing the statement as to the use which artists made of photographs.

Mr. Cocking also said a few words, after which a vote of thanks was passed to the readers of the papers, and to those who had joined in the discussion.

The President, after some observation as to the advances which had been made in art photography since the exhibition of 1851, when he acted as a juror, and drew down upon himself severe remarks on account of the unfavourable criticism which he had felt it his duty to pass on the want of artistic merit in the photographs then exhibited, stated that the next meeting of the Society would be held on the second Tuesday in April, instead of the first, as announced.

A photograph by moonlight, taken by Mr. Dunmore, was shown. Mr. Gerson, of the Berlin Photographic Company, exhibited some copies of pictures; and Mr. Whaite a copy, by Mr. Mayall, of a portrait of M. Daguerre.

South London Photographic Society.

The monthly meeting of this Society was held on Thursday, March 3rd, at the Society of Arts, Adelphi. In the absence of the President, who was prevented from attending by illness, the chair was occupied by Mr. E. Cocking, Vice-President.

The minutes of the two preceding meetings having been read and confirmed, Mr. A. Langton was duly elected a member of the Society.

Mr. E. Dunmore then read an Addendum to his paper "Our Artistic Competition" (see page 110.)

Mr. E. Cocking, in the course of a few remarks, said that a great many of the points of Mr. Dunmore's paper must be left for the Committee to settle. A valuable suggestion was, that small subjects should be given out—as perhaps, in some of the subjects, they had aimed too high. Hitherto the subjects chosen might have been a little too historical—that is, demanding the highest powers of composition, whereas simpler subjects might produce more competitors. The photographer had the difficulty of light and shade to contend with, whereas the artist could always accommodate his light and shade to whatever he required.

---

[*] Dr. Eder, "Theorie und Praxis der Photographie mit Bromsilber Emulsion," p. 62. I may mention here another instance. I sent Mr. Swan, of Newcastle, some of my new emulsion plates, the sensitiveness of which I observed as *three* times the sensitiveness of a wet plate. Mr. Swan tried these plates, and wrote me that he fixed the sensitiveness as *six*. If all the investigators would work under exactly the same circumstances, they would certainly get exactly the same results.

Mr. Cobb said he agreed with one part of Mr. Dunmore's paper, wherein he stated that there was little more artistic feeling in photographers now than fifteen years ago.

Mr. S. Fry said he must differ totally from both Mr. Cobb and Mr. Dunmore about the advance of art in photography The public, he said, demanded a great deal more art in photographs now, and they got it. Artists often sent their sitters, when enough sittings could not be obtained, to photographers, and then reproduced the pose, lighting, &c., and, in fact, a facsimile of the photograph. Look, he said, at the many examples shown in the shop windows of photographs; and look at the works displayed at the Academy, and the photographs were immeasurably superior. No painter dared be without the best collection of photographs. Take the Continental studios and shop windows, and compare them with the English, and the latter were far superior. Photographers worked hard, and, in his opinion, had advanced wonderfully in art feeling.

Mr. Dunmore said his remarks applied to landscape, and, he contended, that had not advanced as portraiture had.

After some further remarks from Mr. Atkin, Mr. Bridge, Mr. Pearsall, and the Chairman,

Mr. Warnerke read a paper on "Two Practical Points" (see page 111).

Mr. Warnerke also explained a new shutter invented by Mr. Barclay. This shutter is worked by pneumatic power, and the exposure begins at the middle, and can be easily regulated to either an instantaneous or prolonged exposure. Mr. Warnerke then alluded to what is known as green fog in gelatine emulsion, and stated that he had found a weak solution of bichromate of potash to entirely clear it of any such fog, but that it reduced the sensitiveness to about one-half. In reply to a question from Mr. Atkins, he said he had not found the density affected by the addition of the bichromate of potash.

Mr. Dunmore said he had found ammonia keep albumen very satisfactorily.

Mr. Ayres advocated the following as answering well in his practice, viz.—

Eggs	3
Water	80 ounces
Ammonia	18 drops

The Chairman, in alluding to papers for the next meeting, said it had been proposed by Mr. York that a very interesting evening might be arranged to show lenses and condensers for lanterns. Mr. York had offered to bring a lantern, and thus practically demonstrate the difference of such lenses.

Mr. Foxlee suggested that lanterns should also be included in the exhibition, and means given of showing pictures by lanterns using other light than gas.

The Secretary having been empowered to communicate with Mr. York, opticians, and others with respect to such an exhibition, and votes of thanks passed to those gentlemen who had contributed to the interest of the evening, the meeting adjourned.

Edinburgh Photographic Society.

The fifth ordinary meeting was held at 5, St. Andrew Square on Wednesday, the 2nd inst. In the absence of the President the chair was occupied by Mr. Forgan.

The minutes of the last meeting having been read and approved, the following gentlemen were unanimously elected ordinary members:—Messrs. W. D. Valentine and John G. Atkinson. The business of the evening was a paper on the Lime Light by the Rev. T. Frederick Hardwich (see page 115), which was read by Mr. F. P. Moffat.

Mr. J. M. Turnbull remarked that he quite agreed with Mr. Hardwich, that to employ a small jet and heavy pressure was wrong; that, on the contrary, the aperture should be tolerably large, and the lime kept close to the nipple; of course, on the other hand, it must not be more than one-twentieth of an inch, as that would spread the flame, which requires to be condensed to get up the heat to cause the lime to burn. He also thought, with Mr. Hardwich, that the angle of the jet should be at right angles, in order to throw as strong a light as possible on the condenser. In regard to explosions, he did not quite agree with Mr. Hardwich, that any photographer was competent to use the lime light; when the mixed gases were employed, he was of opinion that only men who were thoroughly well up to the work should be in charge; but there was no necessity for using the mixed gases unless the screen, requiring to be covered, was a very large one. The so-called safety jet was easily managed and very safe, although it was possible to have an explosion even with it, as there was no such thing as a perfect safety lamp in the market.

Mr. W. H. Davies remarked that Mr. Hardwich had simply brought an apparatus before the Society which had been used by it for a long time, and was made by himself (Mr. Davies) some seven or eight years ago. He did not exactly know what was called a safety lamp, but the instrument on the table to-night was constructed on the principle of the Davy Safety Lamp. At the two ends of the tube where the gases meet there is a bit of Davy safety wire, and the centre of the tubes are packed with the finest shot imaginable, so that no flame whatever can pass through the tubes from the jet. If it tries to, the the flame is driven back at once, so that an explosion is almost an impossibility. The only way to get an explosion would be to put a pressure on one bag alone, and thus forcibly drive the flame through the tube.

The Chairman then asked if the shot ever required cleaning.

Mr. Davies replied that it very rarely did; in fact, the burner before the Society to-night had not been cleaned since it was made, and had been used constantly.

Mr. Turnbull said that Mr. Davies must not trust too much to the shot, as it was quite as easy to have an explosion with, as without, the shot. The best way to avoid explosions was to be always careful, in lighting the lamp, to *turn on the hydrogen tap first, and after it is lighted* to turn on the oxygen, and reverse the order when extinguishing.

Mr. Hume remarked that packing the tubes with shot or anything, was in direct opposition to what was recommended by Mr. Viles, who was strongly in favour of having them quite empty. He had got a lamp from London some time ago, constructed on this principle, which he found to answer very well. He thought the danger of explosions while using the gas had been much over-rated; with ordinary care there was little or none. The real danger of explosions was during the manufacture of the gas, such as the retort bursting.

Mr. Turnbull said that he always used a very thin retort, either made of glass or very thin sheet-iron, so that, should it burst, it would do no damage.

Mr. Dobbie asked if there would be any danger, supposing the aperture at the cock was fully opened and more gas required, if an extra weight was put on one of the bags.

Mr. Davies replied, that theoretically the bags should be equally weighted; but practically that was impossible, and as long as the weights were within a reasonable margin the same—say a half cwt.—there was no danger.

Mr. Aird contended that a very much larger margin in the weights was quite safe, and that no explosion could occur unless the one weight was sufficient to drive either gas right through into the other bag.

Mr. Craig-Christie was sorry to hear Mr. Aird uphold such an opinion, as he could not condemn it too strongly. In his opinion the weights should be as nearly as possible alike. He thought the lamp constructed by Mr. Davies a very perfect one; the only danger he saw was in the shot in the tube, through time, getting oxidised and driven up to one end of the tube. The precautions at the end of Mr. Hardwich's paper could not be too closely attended to. Mr. Turnbull's hint regarding thin retorts he thought was a very valuable one.

A hearty vote of thanks was proposed to Mr. Hardwich for his very interesting paper.

A number of large size photographs, printed in platinum by Mr. Valentine, were passed round the table, and very much admired.

Dundee and East of Scotland Photographic Association.

The sixth ordinary meeting of this Association was held in Lamb's Hotel on Thursday, March 3rd, when a good number of members assembled to compare results of the experiments by the electric light, &c. Mr. J. C. Cox presided.

After the Secretary had read the minutes of the last meeting, which were approved and confirmed, the following gentlemen were elected members of the Association:—Messrs. G. D. Macdougald, Robert S. Baxter, W. A. Douglas, John Matheson, Patrick Sandeman, Peter Taylor, and David Prophet.

On comparing results of the meeting at the Camperdown Linen Works, on February 23rd, it was found that some excellent negatives were obtained by Messrs Donald, Johnson, and Robertson, by the electric light on dry plates, with exposures varying from fifteen to thirty seconds. Some very good prints were also exhibited by Mr. Tannahill and others. As there appeared a general desire for another series of experiments, Mr. Cox most kindly invited all the members to be present at Lochee again on the evening of Wednesday, the 16th inst.

The President, in remarking upon the desirability of preserving the photographs which might be taken from time to time as records of the progress of the Society, generously offered to provide, at his own cost, a suitable folio appropriately lettered, together with a chest for containing it.

Messrs. Valentine, also most kindly volunteered to present an album for containing the portraits.

A vote of thanks to Mr. Cox and Mr. Valentine was carried by acclamation.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting was held at the Museum, Queen's Road, on 2nd March, Mr. W. T. Stephens in the chair.

The minutes having been passed, Mr. Frederick Wills was elected an ordinary member.

The Chairman (in accordance with a notice given at the previous meeting) proposed that the time of meeting be altered from 7.30 to 8 o'clock, the meeting to commence punctually to the minute. This proposition, after some discussion, was carried.

The Chairman then called upon Mr. Brightman to read his paper, entitled "Stray Notes on Gelatine Plates" (see page 116), on the conclusion of which,

Mr. Daniel asked Mr. Brightman how long the negative he spoke of had been exposed to light; to which

Mr. Brightman replied, about three months; the mark he referred to on the plates unexposed was a slight veil or fog where the paper had lain.

The Chairman remarked that in commercial plates the result was often just the reverse—complete want of sensitiveness.

Mr. W. H. Oborne stated that when in Turkey and Russia, last year, he exposed many plates, and some, though very rapidly exposed, were over-exposed and weak, and he had to intensify, which he had since done, with mercury and iodide, and they had changed colour and density to a fearful extent. He, however, believed the bichloride of mercury and dilute ammonia to be perfectly safe.

Mr. H. A. H. Daniel remarked that one great peculiarity about the mercury and ammonia intensification was the great diversity of colour or shades of colour produced, hardly any three being exactly the same.

Thanks to Mr. Brightman for his paper closed the proceedings.

NEWCASTLE-ON-TYNE PHOTOGRAPHIC ASSOCIATION.

The inaugural meeting was held in the theatre of the Literary and Philosophical Society, Newcastle, the Rev. Charles Smith, Felton, in the chair.

On the proposal of Mr. Mendelssohn, the minutes were taken as read. Ten new members were nominated.

Professor Freire Marreco commenced the exhibition of a splendid collection of photographic transparencies as seen by the oxy-hydrogen lantern, the peculiar merit of which is that it gives to the photographs, when thrown on a white sheet, an appearance not only effective, but exceedingly realistic.

Some sculpture pieces by Mr. York were greatly admired, as were also a few of his famous series of animals taken in the Zoological Gardens, London. Other striking features of this gentleman's exhibits were some of his interiors and views of cathedrals, which elicited much applause.

The photographic selections sent by the Woodbury Company introduced a process of an entirely different character, a remarkable feature of which was that the transparency was taken by a purely mechanical process, and various tints very easily obtained. Some of the views were coloured with Prussian blue, which gave them a very picturesque appearance; while another feature in these particular views which was worthy of note was that several of them were instantaneous, and the instantaneous shutter was placed in front of the lantern, by which the audience was given an adequate idea of a momentary exposure.

The Norwegian series by Mr. Mounsey, Darlington, were interesting as showing what a variety of pictures can be obtained in one tour by an amateur. His photographs of Norwegian peasants were remarkably good.

A capital illustration of the effects which can be produced by means of photography was shown by the exhibition of a photograph of a flash of lightning, taken by Mr. Crow during one of the storms in July last year.

Mr. P. M. Laws, Newcastle, showed a series of local views, and a fine portrait of the president, Mr. J. W. Swan, which was taken by gaslight, printed by gaslight, and exhibited by gaslight.

Mr. J. P. Gibson, Hexham, showed a number of crystal effects, such as frosted trees and frozen waterfalls, which were highly appreciated.

The micro-photographs by Dr. Bewick were also much admired.

Messrs. Sawyer and Son, Newcastle, exhibited some choice instantaneous views taken in 1867, when the British Association was in Newcastle.

The following officers were then elected:—

President—Mr. J. W. Swan.
Vice-Presidents—Prof. Freire Marreco and Mr. W. Armstrong.
Treasurer—Mr. P. M. Laws. *Secretary*—Mr. J. B. Payne.
Council—Dr. Bewick, Mr. Davidson, Mr. J. W. James Downoy, Professor Herschell, Mr. Mendelssohn, Mr. Sawyer, and Mr. A. L. Steavenson.

The meeting, which was a most successful one (there being at least 400 to 500 persons present), was brought to a close by votes of thanks to Exhibitors, Lecturer, and Chairman.

To Correspondents.

Wm. Shawcross.—Madder lake is permanent, but the ordinary crimson lake is very fugitive. We did not assume you to be a manufacturer of the article, but merely suggested that you should dissolve pigmented gelatine from the surface of the commercial tissues.

F. C. M.—You had better line your tent with one or two thicknesses of Turkey-red calico.

Spots.—On the sample you send two kinds of spots are present. Those which are dark are probably due to metallic particles in the paper, and the light smear-like markings may arise from greasy matter coming in contact with the paper before sensitising.

Wm. P. Robinson.—We cannot tell you the maker's name.

F. W. Hart.—If anyone orders a negative expressly, and pays the price asked, he naturally expects to have it.

Dr. Hermann Fol.—You shall have news shortly.

S. G. Rouse.—You will find full particulars of what you require on page 409, vol. xxiv.

S. W.—The snow pictures you sent are certainly worth of praise.

F. B. C.—The neutral chromate of potassium is yellow and has very little sensitising action on gelatine, but the corresponding ammonium salt is as effectual in this respect as the bichromate.

L. M. Ramsden.—They probably arise from contact with the packing paper, and you can guard against this king of thing by packing the plates with strips of card at the edges.

M. Bridges.—Sulphur melts at 114° C. and as a somewhat higher temperature it becomes thick and viscous. It should not therefore be heated above 120° C.

A. Emshall.—Vulcanised india-rubber is insoluble in benzole or ether. You should obtain simply masticated rubber, and dissolve it to the extent of about four grains in each ounce of benzole.

Lens.—A rapid rectilinear is the best lens for the purpose you name. The general character of the negatives we consider good.

Medium.—Thank you. We shall avail ourselves of your kind permission to use article for the News. Copy of our Year-Book has been forwarded you.

E. A.—Certainly they are to be purchased in this country; about a penny a piece.

Lux.—1. You have not sufficient acetic acid in your developer. Try at least twice as much. 2. It would be as well to take the lens back to the maker as any tinkering on your part may result in serious damage. 3. It has apparently become quite rotten and decayed by the action of air and moisture. No coating of varnish or paraffin will be effectual in preventing decay now, so you had better replace it by new work and varnish that.

Charles Richardson.—All your examples of work are good from a technical point of view; but as the lighting appears to have been identical in every case, it is evident that you have much to learn before you will be qualified to take a situation in a studio. Your attention should now be devoted to the artistic aspects of photography, and the adaptation of the light to the peculiarities of each sitter.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

VOL. XXV. No. 1176.—*March* 18, 1881.

CONTENTS.

	PAGE
A Suggestion for a Standard of Comparison for Lenses	121
Measuring the Sunbeams	122
Prism or Mirror	123
Photography In and Out of the Studio	123
At Home	124
Notes	125
Topics of the Day	126
Reviews	127
The Ferrotype: How it is Made. By W. Heighway	128
Collodion Gelatine Emulsion. By H. L. T. Haakman	129
Action of the Acid Developer on Highly Sensitive Bromide Emulsion Plates. By Dr. H W. Vogel	129
Photography at the Melbourne Exhibition	130
On the Infra-Red Lines or Bands in the Sun's Spectrum. By John William Draper, M.D	131
Correspondence	131
Proceedings of Societies	132
To Correspondents	132

18.3.81

A SUGGESTION FOR A STANDARD OF COMPARISON FOR LENSES.

How often we hear such a question as, "How rapid do you think that lens is?" or, "How long an exposure do you think I should require with such and such a diaphragm?" Surely it is not as it should be, that such questions are asked. Does it not point to the need of some kind of universally-acknowledged standard for comparing lenses? It may be said, that surely the plan so much insisted on by Dallmeyer, of stating the rapidity of a lens by giving the ratio of its aperture to its focal length, should be a sufficient standard. It does not seem to be so, however. There is still a little calculation left for the photographer to do before he can compare two lenses, and this, simple as it is, seems actually too difficult for some, whilst the majority of those who are able to make the calculation seem too indolent to use it in practice, and rather expose in a haphazard way, trusting to a kind of instinct which comes with long practice.

It has been proposed that a lens of certain rapidity should be used as a standard (say one whose rapidity was represented by $\frac{f}{10}$, or $\frac{f}{4}$), and that all other lenses, and the stops of all other lenses, should have figures on them, giving their rapidity in terms of whatever lens was chosen as the standard. Doubtless this would practically be as good a plan as any other, but that it seems too arbitrary, and that there would, probably, not be the smallest chance of agreement among different opticians as to what rapidity should be taken as the unit.

There is another standard, however, which no one seems to have thought of; one which is absolute, invariable, and quite independent of any one particular lens. This is nothing other than the brightness of the object to be photographed. Of course, it is scarcely correct to say that the brightness of any object is actually invariable; but with a certain lens and stop, the *relation* between the brightness of the object and the brightness of the image given by the lens will be constant.

Let us see how this standard might be used in actual practice. It is not necessary here to enter into a mathematical proof; but it may be taken as a fact that, were it possible to make such a lens as to have a focal length equal to one-half of its diameter, this lens would give an image as bright as the object itself. This is leaving out of consideration the small amount of light lost from the reflecting surfaces of the glass, and from its imperfect transparency. From this we may deduce a very simple formula, whereby we can, for any lens, state the brightness of the image which it gives in terms of the brightness of the object. Let—

f be equivalent focal length.
d ,, diameter of aperture.
x ,, brightness of image in terms of brightness of object.

Then we shall have

$$x = \left(\frac{d}{2f}\right)^2$$

All that would be necessary would be to stamp on every lens and on every stop a figure representing the result of working out this extremely simple formula, and then the photographer would have nothing to do but to read this figure, and he would know exactly what rapidity his lens was with that diaphragm, and there would be only one factor left to judge in making an exposure—namely, the amount of light in the studio and in the field; and here, if he had not sufficient confidence in his judgment, one of the various ingenious actinometers lately invented would come to his assistance. He would have, with respect to his lens, no calculation whatever to make. He would simply know, from reading the figure on the stop he had inserted, that the image on his ground glass was so many times less bright than the object focussed.

Let us take an example. Suppose an ordinary portrait lens; the ratio of focal length to aperture of such a lens used without a stop is generally about four, therefore the brightness of image given by this lens in terms of the brightness of the object $= \left(\frac{1}{2 \times 4}\right)^2 = \frac{1}{64}$. That is, the brightness of the ground glass image is $\frac{1}{64}$ of the brightness of the object.

The figure stamped on the outside of the lens tube would be $\frac{1}{64}$. On the first diaphragm it would probably be about $\frac{1}{100}$; on the second, $\frac{1}{128}$; third, $\frac{1}{256}$; fourth, $\frac{1}{512}$.

Take one more example. A rapid rectilinear lens used with the first stop with the ratio of about $\frac{1}{11}$ would give as the result of the above formula the figure $\frac{1}{484}$. Were this figure stamped on the diaphragm, the photographer would no longer need to make any calculation whatever to know that this lens, with its first stop, would be just a shade faster than the last mentioned portrait lens with its fourth stop, and that it might be used in its place with very great advantage.

Why should not our leading opticians take up this idea? Surely it would be quite as easy, and in every way better, to stamp the stops of their lenses in this manner, than to stamp them with entirely arbitrary figures to denote nothing except that there are in the little diaphragm case so many stops of larger diameter than the one which the photographer is at the time using.

A result which may be deduced from the above formula, and may be of use, is that a relation is established between exposures in the camera and contact exposures for similar sensitive films under negatives.

MEASURING THE SUNBEAMS.

The importance of measuring the duration, the intensity, and the quantity of solar radiation is a subject on which it is needless to speak in the columns of this journal. Our readers are already acquainted with numerous appliances having this object for their end, and it is now our purpose to furnish them with details of two others devised by Mr. Winstanley, a gentleman with whose name most of them are familiar as a former contributor to these columns. There are two very obvious principles upon which the construction of solar radiation instruments may be based. One is found in the chemical changes thereby induced in certain bodies—notably in photographic action—and the other in the heating effects of radiant energy. At the close of 1875 we published weekly diagrams showing the diurnal variations in the quantity of daylight as measured by a photographic method also devised by Mr. Winstanley, and which, so far as we have seen, is the only practicable one extant. Early in 1876 its author wrote a very interesting paper on "Darkness and Disease," which, with a striking diagram demonstrating his contention, we published in these columns. We have before us, as we write, a copy of our Parisian contemporary, *La Nature*, containing a terse and clear description of Mr. Winstanley's first apparatus for the measurement of solar radiation by means of its heating and expansional effects. A translation of this description we shall now proceed to give. Tissandier, the writer, after alluding to the crystal ball of Campbell, which, by the concentration of the solar rays, carbonises a band of cardboard suitably disposed within a bowl, proceeds to say:—

"A learned English physicist, Mr. David Winstanley, has notably improved upon this plan. The apparatus of Mr. Winstanley consists of a differential air thermometer, T,T′ (fig. 1), mounted on the beam of a balance, as is shown in our engraving up above. The two bulbs of the thermometer T and T′ are coated with smoke black. The left bulb alone is exposed to the operation of the light, all the rest of the apparatus being enclosed within a box. When the sun shines, the air contained in the left-hand bulb expands and forces the mercury of the differential thermometer along the tube. This disturbs the equilibrium of the balance, the beam becomes inclined, and the point of a pencil mounted in the support F becomes pressed upon a dial of paper mounted on a disc of brass. This disc turns continually upon its axis, and carries with it the paper dial, which resembles that represented in our figure 2. When the sun no longer shines, the balance retakes its equilibrium, the pencil ceases to be pressed upon the paper, and the trace which it has there marked is interrupted. In our figure 2 the line A A A represents that which was inscribed by the pencil of the recorder on the 1st of September, 1879. One sees that the sun shone from about six o'clock till half-past seven, and one also notices that clouds were visible from half-past seven to eight, because there the line is interrupted. It is easy, too, to count the duration of these interruptions up to a quarter-past four p.m., where the radiation is definitely arrested for the day. To complete the description of the ingenious apparatus of Mr. Winstanley, we may add that the metallic bulbs A and B are mounted upon screws at the extremity of the beam,

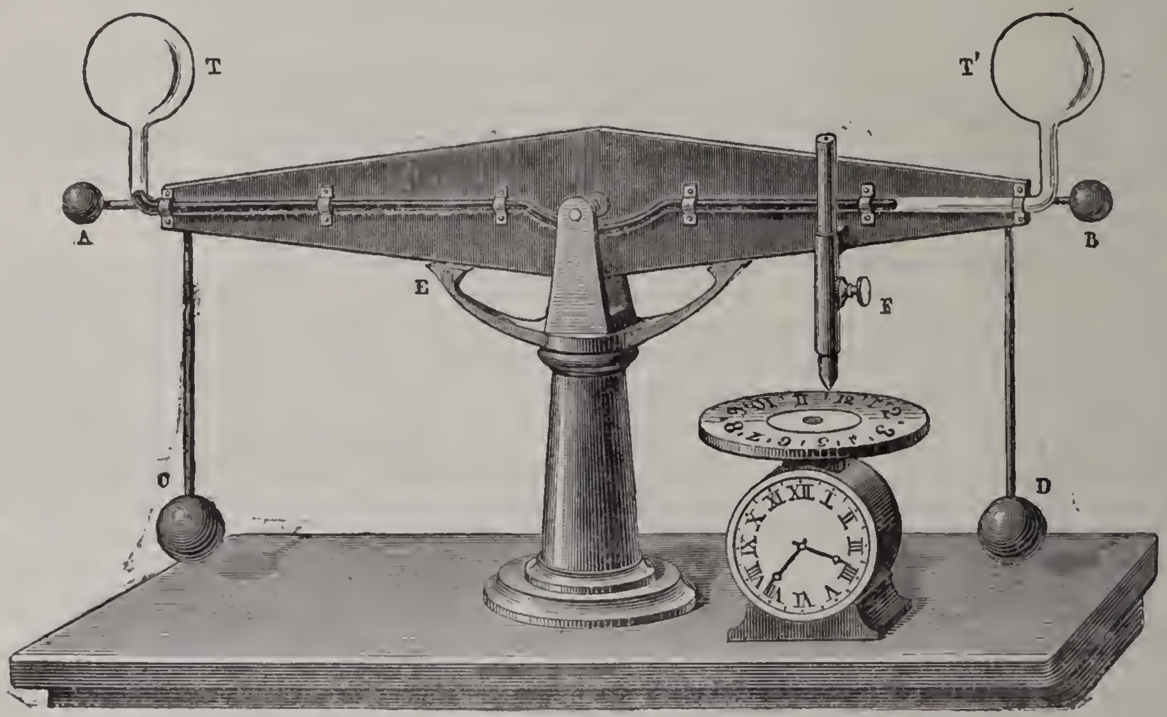


Fig. 1.
Winstanley's Apparatus for recording the duration of the Sunshine.

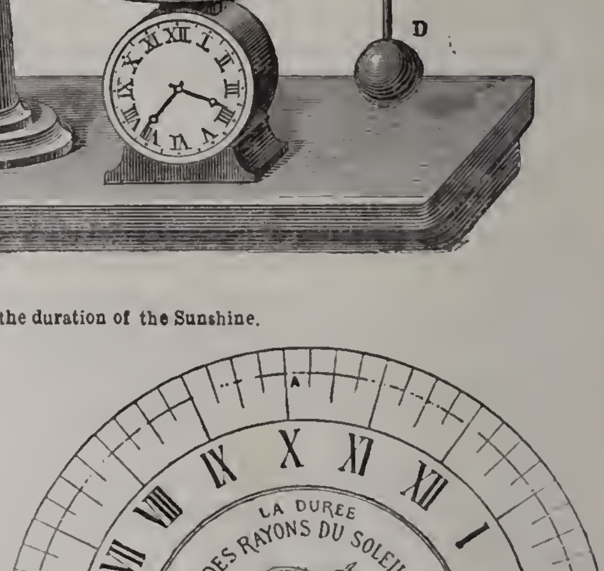


Fig. 2.
Facsimile of a record of the duration of the Sunshine made by the Winstanley Apparatus.

and serve to put the balance in equilibrium. C and D are rigid metallic stems, and serve to counteract the gravitating motion of the mercury when the beam inclines. The trace which we have reproduced in the reduction of one-half is an example of those which the inventor has obtained at his observatory at Douglas, in the Isle-of-Man."

PRISM OR MIRROR.

NOTWITHSTANDING the fact that several methods of insuring the reversal of the gelatino-bromide image have been recently described in our pages, and that very satisfactory results may be obtained by these methods, the photographer whose time is valuable, and who has but little leisure for experiments and for familiarizing himself with new processes, will prefer to follow his ordinary method of working, and merely to place a prism or a mirror in front of the objective.

The necessity of reversed negatives forms a bar to single transfer carbon printing, collotype, the new Woodburytype, Waterhouse's photo-engraving, and several other processes: not a very serious bar, it is certain, but still a notable obstacle, and many are prevented from studying or practising these methods for the very simple reason that inverse negatives are not to hand.

The reversing mirror—when in good order—fulfils its intended purpose admirably; but very few photographers make use of it, just because there is no certainty of its being ready for use when wanted; and the operation of re-silvering, except in the case of a person who is experienced in the matter, requires the expenditure of a considerable amount of care and time. Moreover, in the case of a mirror, it is not easy to judge of the correct exposure, as so much depends on the condition of its surface, and this surface undergoes a continual deterioration until it becomes so bad as to render a re-silvering imperative. Indeed, the exposure required may be one-third more than would be necessary were the mirror not used, or it may be six times as much.

When, on the other hand, a prism is used, the increase required in the time of exposure is constant for the same instrument, and may generally be estimated at nearly twice what one would give with the simple lens. But here another circumstance steps in, and by simply silvering the reflecting surface of the prism, one can, in the case of a good instrument, bring the rapidity of action quite up to the standard of a well silvered and polished mirror. The silvering of the reflecting surface of a prism is a very different affair from the silvering of a mirror, as no polishing is required, and the back can be so protected as to render re-silvering unnecessary, the reflecting surface of the metal being in contact with the glass; and it is almost a matter of indifference whether one makes use of the chemical silvering process, or of the old-fashioned mercurial method; this latter, however, giving a somewhat greater rapidity of action.

Mathematicians tell us that the idea of silvering the reflecting surface of a prism is altogether absurd, and that by no possibility can any increase in the quantity of light be gained by such a proceeding; and we well remember the look of disgust with which a Cambridge Don regarded a silvered prism which we showed him the other day; and it was not until we had given him a practical demonstration that he called to mind the imperfections that exist on the surfaces of the best polished glass which the optician can turn out; and that films of adherent air or moisture may interfere with total reflection, and upset elaborately-learned elucidations as to the "critical angle."

We do not wish our readers to imagine that we claim originality as regards the proposal to silver the hypothenuse of the reflecting prism, as this proceeding was strenuously advocated by Charles Chevalier, this optician being the first—or almost the first—to make actinically-corrected objectives for photographic use.

Another point suggests itself in connection with the use of the prism, and that is, the difficulty of obtaining large pieces of crown glass of suitable quality. This is met, for all practical purposes, by the fact that, in the present day, ninety-nine negatives out of a hundred, either are, or might be, taken with lenses which may be well covered by a prism having square faces of two inches and three-eighths, and a prism of this size can be had in Paris for about £3, the optical work being so good as not to appreciably injure definition.

We remember to have seen a reflecting doublet lens at the house of Lerebour and Secretan, in Paris, together with some admirable specimens of work executed with it; but we have not had an opportunity of trying the instrument.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photo-Engraving and Spence's Metal—An Improvement in Spectrum Photography—Art Photography.

Photo-Engraving and Spence's Metal.—The possibility of using Spence's metal moulds in photo-engraving was suggested in these columns last year, and when the drawbacks which are attendant upon what are technically termed "process" engravings are remembered, the more desirable does it seem that experiments should be made with this metal. The "processes" known as Leitch's, Cattell's, Alison's, and others are all based upon the same principle. The artist sketches his design with lithographic ink on lithographic paper, and a transfer is made on to zinc, acid being used to bite away those portions of the plate which are not protected by the lines of the drawing. When an artist is skilled in the work, and has sufficient precision in his style to draw his lines firmly, and with just the right quantity of ink, the result, as an outline drawing, is often very perfect; but even the productions of the best draughtsman are liable to a certain fogginess or rottenness if the greatest care be not exercised in the manipulations of the plate. And this is the drawback which we are inclined to think Spence's metal removes. If an acid could be discovered which possessed the utopian quality of only eating its way into the metal in a vertical direction, all would be well; but, unfortunately, acids bite laterally as well as vertically, and the picture is always liable to "rottenness." This is the reason why some artists, from their method of drawing, cannot work in "process," as a hesitancy or inequality in the lines becomes still worse by the action of the acid. In the Ordnance Department at Southampton, a weak solution of formic acid is used, and the operation is hastened by the wafting of a fan over the surface, and this, to a certain extent, obviates the difficulties we have referred to; but the work at the Ordnance Office—photographic copies of engravings, documents, &c.—is different from that in connection with illustrated newspapers, and lends itself much more readily to the purpose. With the wonderful power of divisibility possessed by Spence's metal, there is no reason why a mould should not be taken of the transfer (which in this case should be on glass), and the drawing in relief obtained by a second mould in the manner described last week. Undoubtedly, to ensure good results, an artist would need special experience, as everything would depend upon the quantity of the ink used. The latter, we imagine, would require to have considerable body in it. Mr. Warnerke has suggested bisulphide of carbon as a solvent for Spence metal.

An Improvement in Spectrum Photography.—An improvement in the method of photographing the spectrum has been effected by Herr Schönn. To overcome the difficulty that even by the finest glass plates a large part of the ultra-violet spectrum is absorbed, Herr Schönn instructed Herr Kohl, of Chemnitz, to make Geissler tubes having rock crystal at one part. Some of these so-called "gas tubes for ultra-violet rays with rock-crystal window" have the window close by one pole, others in the middle, so that one can always get the whole ultra-violet spectrum of a particular part of the glowing gas, and either photograph it, or observe it with the apparatus Herr Schönn has made for the purpose.

Art Photography.—There is nothing like the unanimity with which people agree on the stage, save the manner in which doctors differ. The great question in photographic circles now is, has photography advanced in an artistic aspect of late years, or not? Mr. Payne Jennings takes a pessimist view of the situation; Mr. E. Cocking is inclined to second him, but at a considerable distance; Mr. E. Dunmore has "no doubt the art in photography has been comparatively at a standstill for many years;" Mr. Cobb holds similar views. On the other hand, Mr. Valentine Blanchard believes an immense advance has been shown by the photographic exhibitions of the last ten years; the tenor of Mr. Jabez Hughes' remarks are in favour of the art excellence of photographs; Mr. S. Fry is enthusiastic over the "enormous strides" made in art photography, especially as evidenced by the photographs exhibited in the shop windows; and Mr. Glaisher is equally sure of a great improvement since the Exhibition of 1851. Where so many differ, who is to decide?

◆

At Home.

MESSRS. WINDOW AND GROVE AT BAKER STREET.

The establishment of Messrs. Window and Grove is, in some sort, historical. If not the first, the late Mr. Window was one of the first to settle in that fashionable quarter, constituting the loadstone towards which so many have since gravitated. Why photography and Baker Street should have become synonymous terms is not very clear; but we suppose fashionable loungers are naturally attracted towards Baker Street Bazaar, and fashionable photographers have come after them. But the Window and Grove establishment has other claims upon history. The cabinet portrait was born here. Mr. Window was the first to suggest and press upon the attention of the public this familiar style, which has not only become popular in this country, but as the "carte album" is in favour throughout the Continent and in America. We ourselves remember seeing years ago, in one of the first studios of Vienna, half a dozen cabinets from the Baker Street studio, which had been sent for to serve as models, while woodcuts appeared in the foreign journals of Mr. Window's work, to show size, proportion, and style of the new portrait. Again, the cameo portrait—four heads taken from different points, and embossed upon a card, in the form of a diamond—was due to Mr. Window, a *format* that enjoyed a good deal of popularity, and deserved yet more; while it was here, in this studio at Baker Street, that the first essay at printing portraits in carbon was made by a private firm.

It is not surprising that an establishment which has had so much to do with the cabinet portrait, should still look with favour upon a child of its own. Mr. Grove, who is good enough to receive us, and to act as guide through the establishment, tells us the demand made for cabinet pictures is still so brisk, that no endeavour has been made to introduce the panel picture, which, in many studios, has long been fashionable. A vignetted bust is the favourite portrait, the delicate tinted ground being secured, as we presently see, by means of fawn-coloured cloth, stretched without a fold to serve as background. Carbon upon opal—the red chalk carbon—is also a speciality of Messrs. Window and Grove, the pictures measuring from fifteen to twenty inches, being produced from enlargements of the original cabinet negative. In a word, the establishment is working, and to some purpose, too, upon the lines it adopted a dozen years ago.

Before going upstairs, some fine portraits in carbon, printed either on paper, and worked up with crayon, or transferred to opal, and finished in sepia, deserve to be mentioned. Here is a group of musicians, to wit: Sir Julius Benedict, Charles Hallé, von Bülow, &c.; here, in another corner, Gladstone and the late Earl Russell; while further on we have Marie Wilton, J. L. Toole, Ellen Terry (a magnificent cabinet series of the latter as Iolanthe); we must not, by the way, forget Bancroft, Conway, &c. Some of the transfers have been made upon rough drawing-paper, and the rugged surface of the latter adds a further charm to the bold portraits. All the carbon pictures are printed and developed on the premises, more than can be said of the productions of most photographers who exhibit prints of this character.

The light is not very good, for it is a dull February day, and Mr. Grove, who has been using gelatine plates of two of the best-known firms, tells us that cartes have required an exposure of from eight to ten seconds, and cabinets from sixteen to twenty. It is Mr. Grove's practice to take two views of each pose, giving the one two or three seconds' more exposure than the other, and, in this way, he can rely pretty well upon his gelatine films.

"You are using, then, nothing but gelatine?" we say. "To-day I am, and throughout the winter I have done so; but I shall get back to wet collodion when I can." Mr. Grove fully appreciates the value of gelatine; it enables him to take pictures and guineas at the same time, which otherwise would be lost to him; but were both mediums equally open to employment, he would unhesitatingly prefer a wet plate. It might be difficult, possibly, to specify the particular point of advantage—whether it lies in being able better to control the development, or in securing deeper and more harmonious effects; but that the wet plate, when there is light enough, has an undoubted advantage—for the present, at any rate—Mr. Grove fully believes. It is in the print, according to Mr. Grove, rather than in the negative, that the weakness of a gelatine film is to be seen, and a practised eye should have no difficulty in pronouncing any print the result of a wet or dry plate.

Mr. Grove invariably employs the oxalate developer, for one reason because many of his negatives have afterwards to be enlarged for carbon work, and it is impossible to get a good enlargement with any negative showing a trace of pyrogallic staining. We are invited into the enlarging-room. It is of the simplest kind: an empty room lighted by a single window, looking on to a small yard. By craning your neck out of window, you might get a glimpse of the sky above, but not otherwise. Yet Mr. Grove makes good use of the parallel rays that fall into this well of a place. The window can be shuttered at a moment's notice, with the exception of a single pane, in which a bellows camera has been fitted. The transparency is fitted in the camera, and the light reflected upon it by a large sheet of opal glass, twenty-four inches square, that is outside the window fixed to a board that slopes at an angle of 45° with the casement. The enlarged image thus thrown into the room is received upon an upright screen, which either bears a focussing glass or carrier with plate. The focussing or enlarging is easily done by approaching or receding the screen. This latter is a sturdy frame-work of wood, standing five or six feet high, the bottom being fixed in a four-wheel cart or trolly, which moves on a tramway laid across the room. The wheels are small, and as the whole structure is rather heavy, it only moves slowly when pushed, and does not, indeed, move at all unless considerable force is brought upon it. So that both large and small pictures may be taken, there is an arrangement in the frame-work for lowering or heightening the focussing screen or dark slide, the latter being kept in position by a simple wood clamp. The whole frame-work and trolly together is so simple that any carpenter could put it together, its solidity being one of its most valuable qualities.

The studio is one of the smallest we have seen in a first-class studio, and you wonder at first where the dark room and laboratory can be. There is but one camera visible, with a hood extending some four feet in front of the lens; but although room is limited, there is not the least sign of crowding. Mr. Grove believes in simplicity in a studio, and it is well he does so, otherwise a glass room twice the size would not have sufficed. While there is but one camera, there is a whole battery of lenses, here, under the table, of all sorts and sizes to fit it. Our host makes use of a universal adaptor—or universal front, it might be called; that is to say, instead of having half-a-dozen spare flanges to each lens, he has each lens screwed into a front, and the whole series of fronts (all of the same size) lift in and out of the one camera.

Another simple arrangement is the method of supplying the plates from the dark room. This is underneath the studio, so that there is is no smell of collodion in summer time, and the heat is never oppressive. A little shaft runs down into the apartment beneath, and the carrier and plates are in this wise conveyed to the glass room. There is a speaking-tube, moreover, between the apartments; but signals are usually conveyed by a whistle. One whistle from below means that the plate has been developed and is all right, and that the visitor may be bowed out. In these circumstances, even gelatine plates may be developed before the sitter departs, for there is no delay in immersing the plate in the oxalate bath. As only one sized plate is used in the establishment, whether for carte or cabinet pictures, simplicity here comes in again to aid in the work.

Mr. Grove's highest class of work is the red carbon portrait upon porcelain. We do not know if our host represents the only firm of portraitists in London who are carbon printers, but we rather think so. Here is the developing room, and here the three huge tanks, some three feet square, required for the process. The first is for warm water, the second for cold, the third is the alum bath. The carbon printing is conducted under Mr. Grove's personal supervision, for it is, as everybody knows, touchy work at the best. It is not unusual to develop a score of pictures in order to obtain one that will please. "You may secure a very good impression on the second or third trial," said Mr. Grove, "but then you always try again to see if you cannot get a better one still." When you have a good carbon print, it is worth all the trouble, our host thinks, and he is quite satisfied, apparently, with the results of his tedious labour. Certainly it is not everybody who would work so hard for success.

Carbon portraits upon paper are more difficult to obtain perfect than upon opal; the pot-metal helps out a good many defects, and the film dries upon the surface in a more satisfactory manner. It is Mr. Grove's opinion that carbon pictures—at any rate, for large portraits—must become popular, since the public are gradually getting to know of their permanence, and will in the future be satisfied with nothing else. But it is very plain—and Mr. Grove speaks as a carbon printer of many years' standing—that indomitable perseverance and inexhaustible patience are indispensable in the production of high-class carbon pictures.

Next week's "By-and-Bye" will be "On Groups"; the following "At Home" will be at a "City Phototype Establishment."

Notes.

An exhibition of photographs and photographic apparatus is shortly to be opened in Milan.

The Faraday lecture before the Chemical Society will be delivered this year by Professor Helmholz, of Berlin, at the Royal Institution.

A course of Cantor Lectures at the Society of Arts will probably be delivered by Captain Abney, F.R.S., on the scientific aspects of photography.

At the time of his death, Fox-Talbot was still actively engaged in perfecting his photo-engraving process, which still remains one of the most promising of our mechanical printing methods. The success of the process depends much upon laying what he called an "aquatint ground," and, in his specification, the most improved plan of doing this is not described. In fact, he did not live to write out a proper description of it, and, so Mr. C. H. Talbot informs us, "I had to complete it as best I could."

"I have seen my father use it," continues Mr. Talbot in his note, "but never tried to do it myself. Common resin and camphor are dissolved in chloroform. By varying the proportions a coarser or finer ground is obtained. At the proper stage of the process, this solution is poured upon the plate. The chloroform evaporates, leaving a film. The plate is then warmed and the camphor driven off, leaving the resin in minute particles."

A curious copyright case came up for trial the other day. A photographic publisher, Mr. Ollendorf, of Jewin Street, had ordered four paintings from an artist, which were duly delivered. Mr. Ollendorf had the paintings photographed, but when he attempted to publish the copies, he found that, instead of being original pictures with copyright attached, they were in themselves merely coloured photographs, the copyright of which was vested in another person. For the defence, it was naively intimated that the painter "believed he was doing nothing wrong in availing himself of some published photographs."

The defence, no doubt, was made in good faith, and, indeed, the decision was given in this view. But it is surely a little strange that such ideas should prevail. The painter holds that no one can copy his paintings unless he sells the copyright of them; but a photograph he regards as common property, and never thinks of asking leave in copying it. Nor is the present an isolated instance of regarding a photograph pure and simple as beneath contempt, while when coloured it at once becomes a work of art, with a valuable copyright attached.

The late Emperor of Russia in his youth was a thorough photographer, and one of his intimate friends down to the last was the well-known court-photographer, Levitsky, of St. Petersburgh. In fact, M. Levitsky enjoys a position in the Russian capital that photographers in Western Europe cannot well understand—he stands within the charmed circle that girts Russian aristocracy. According to the *Standard*, after the body of the Czar had been clad in uniform, M. Levitsky was sent for, and, "favoured by a bright morning, a successful negative was taken."

We are glad to see the name of Professor Alexander Herschel—a son of the late Sir John Herschel—among the officers of the Newcastle Photographic Society, of which Mr. Swan has been elected president.

Last Wednesday evening the Photographic Club met at the Occidental Tavern, Strand, and it is understood that this new arrangement will hold good until further notice.

According to the list of members just issued by the Photographic Society of Great Britain—the oldest photographic society in the world—there are among the present members, thirteen who originally joined the Society in 1853, and have remained attached to the body ever since. Of these, the most prominent is Dr. Diamond, well known in years gone by as one of the most active officers of the Society.

The remaining illustrious twelve are Messrs. Bois, Bouham-Carter, Curry, Henshaw, W. Howard, Nowell, Perigal, Pollock, Shadbolt, Shaw, Tudor, and the Earl Somers. The date of the president's election—Mr. James Glaisher, F.R.S.—is 1854, Mr. Lutwidge being the only other member of the Society, still on the roll, who was elected in that year.

It is not so long ago that micro-photographs were a curiosity. Now you may buy in the Lowther Arcade, for fourpence, a child's ivory whistle having at one end a tiny Swiss view photographed from nature, together with a minute lens wherewith to examine it. Micro-photography is hardly a profitable occupation, one would think.

"I never disturb an album after it has once been filled,' said an old photographer to us the other day; and he showed us why. He had a series of three albums, constituting a veritable history, not only of his friends and family, but of photography. One had been completed in 1861, the second had received its last portrait in 1865, and the third in 1870. No matter how faded and antiquated the pictures, they had been permitted to remain in their places, and the collection had thus become the most interesting of archives. Babies were here who had grown into men and women; old friends, who had left but these shadows behind them; young men and maidens now in the fulness of years. "When my friends have offered me more recent and 'better' portraits, I have accepted them, but my rule is never to replace an old portrait by a new one."

It is passing strange to find a learned English professor set right in his science by the "heathen Chinee." Yet so it is. In Professor Tyndall's treatise "On Sound," it seems, there is a statement which, in effect, says that if an open pipe or flute is exactly halved in length, it will sound the same note an octave higher. A Mr. Hsü, as "childlike and bland," apparently, as the rest of his race, followed the advice given, but discovered, on halving his flute, that the tone was *not* as the professor predicted. "I find, however," says Mr. Hsü, "that if you cut off five-ninths of a flute—something more than half, therefore—the remainder always sounds the octave more or less exactly."

Topics of the Day.

APPLICATION OF STEREOSCOPIC PHOTOGRAPHY TO THE SCIENCE OF METEOROLOGY.

BY JOHN HARMER.

The study of cloudland, fraught as it is with so much that is interesting and beautiful as well as practical in character, amply repays both artist and scientist for any labour expended in its consideration. The artistic phase, being a well-worn topic, will not now be discussed, the object of the present article being to indicate a method of securing the photographs of clouds for a meteorological purpose, but in such a way that their beauty and usefulness in the production of pictorial effect will not be deteriorated in any respect.

The value of meteorology in its practical outcome of weather forecast is so great that any means of increasing this power by making the necessary observations and records accurate and permanent should be widely known. Photography has done much in this direction, and the following indicates a further extension. As the motion and characteristics of the different strata of cloud furnish much information concerning the currents and other peculiarities of our atmosphere, the estimation of their respective height from the earth's surface is a *desideratum* of much importance. Hitherto this has been obtained by methods little short of guess-work, principally from the differences in the species of cloud formed at various heights, from two or three rough methods of calculation, and by balloon observations; motion and lack of sharply-defined parts being insurmountable obstacles to the certain but troublesome method by triangulation. This defect of observing power has induced me to endeavour to press photography and the stereoscope into service, the former to procure two photographs at the extremities of a base line, the latter to read off the required data from them when placed in the instrument in conjunction with a scale prepared from terrestrial measurements; the interposition of the stereoscope and scale having the effect of reducing the lengthy base line to that of the width of the eyes; form, height, beauty and all that is valuable being preserved in a permanent record on a glass plate.

It is now well known that two pictures of an object taken from two points of sight, when viewed in the stereoscope, are united, and present the third dimension of solidity, which becomes exaggerated in near objects, and made evident in distant ones by lengthening the interval between the points from which the photographs are produced. This fact points to the necessity of making use of a measured interval, or base line, of considerable length, to render the solid appearance of objects in the two to ten miles of our atmosphere with which we have to do, sufficiently coarse for the required measurements to be practically dealt with. Clouds intended for the purpose are, therefore, taken in an apparatus constituted as follows.

Upon a base about fifty feet long, constructed of wood in a suitable manner to prevent flexion, and turning on a pivot in a horizontal direction, are placed two small cameras, the back edges of whose base-boards are hinged to second ones having a graduated quadrant and rack-work erected from one of their sides for adjustment in altitude; the supplementary board being in turn pivoted at the centre of a part of a divided circle, previously inlaid in the wood at the extremities of the base-line in such a manner that a line passing through the axis of the lenses would cut the pivots. The cameras thus furnished can be adjusted to any vertical or horizontal angle. The adjustments of both cameras must coincide in every respect, except that one is slightly inclined to the right, and the other to the left, so that both point to an object opposite to the centre of the base-line. The exposing shutters of these cameras must be electrically connected in one circuit to ensure simultaneous exposure, and each dark slide employed requires a fine wire strained at its centre from top to bottom immediately in front of the sensitive plate, and as close as possible to it without touching; or a needle projecting an inch or so from the bottom will suffice. The transparent lines produced in the developed negatives will constitute the zero of distance, and will, during the operation of reading off, agree with similar ones on the scale, the construction of which will be presently described. Photographs taken in an apparatus of this description may be considered as two perfect simultaneous observations from two points of sight, with all disadvantages arising from motion, changes of any kind, and want of definition eliminated.

The scale now requires consideration. Upon a large cardboard rule a number of squares in fine black lines, one inside the other, and each one slightly out of the centre of its predecessors to the right hand, the outside square being then divided at a tenth part of its longest dimension to the left of its centre. This line will indicate the zero of the scale. After placing a distinguishing mark or number on the corner of every square for purposes of identification, the cardboard will be ready to be photographed, and reduced at the same time to the intended size of the cloud negatives. Two transparent positives copied from this, and observed when placed side by side in a suitable stereoscope, with the edges representing the left hand one of the cardboard together, will appear on that instrument with the lines composing the zero only a few inches away, and the squares as a succession of vertical planes, commencing from that and receding from the eye in the order of greater to less, each one representing its own distance in space. Illustrations of this appearance may be seen in the geometrical drawings of cubes, cones, &c., formerly supplied for the stereoscope before the introduction of binocular photography. The reduction of a very large and closely-ruled surface can be made to produce a scale of such accuracy that the possible error in the measurement of miles would amount to a very few feet, which is not of the slightest consequence in dealing with the comparatively coarse measurements of thick masses of cloud floating in so short a distance as the few miles of atmosphere capable of forming them consists.

To graduate the scale, and ascertain the value of each of its planes, in respect of distance, the cameras must be directed on terrestrial objects whose distances can be found by any of the known methods, and negatives taken. The two resulting landscapes, when placed in the stereoscope, each superimposed face to face upon its respective scale, and the fine vertical lines or zeros of the whole made to occupy one apparent distance, best performed by having the scale plates adjustable by rack work independently of the plate it supports, every object and point of the landscape will be found to stand out in the vertical plane suited to its own distance, the relation between them being noted for the values found by measurement of the one to be marked upon the other. As a scale prepared thus would be of no value for any other angle at which the camera might be placed, it would be most convenient to make use of two or three angles only, more being quite unnecessary, and prepare a scale for each, or one with a reference table of values would be sufficient. In respect of altitudes, the terrestrial measurements being accurate only for clouds in the zenith, the intervals and heights of strata at other altitudes would require to be calculated, or verified for the most important degrees, by securing a series of clouds in a short period of time for comparison with the standard scale, their relation to it being tabulated for future use.

Slight fluctuations in the length of the base-line need not be taken into account; it may be tested for constancy, and corrected, if necessary, by taking a pair of views for comparison with the preceding. To ascertain the height of clouds, a pair of negatives of these are placed with the scales in a suitable stereoscope, the zero adjusted, and the height of each stratum noted by observing which vertical plane of the scale it occupies.

Besides this power of measuring, and the exhibition in a very marked manner of the structure of the cloud in its third dimension such a method confers, there would be a better chance of classification and tracing each type, with the help of readings from other meteorological instruments, to its causes, and, therefore, to be better enabled to infer what was to be expected in the matter of weather.

The true heights of the strata at any time, and the direction in which they were travelling, would furnish data for dealing with the many currents circulating through the atmosphere in a much more scientific manner than at the present. The prints, as records, should be made as perfect as possible by the addition of particulars of direction of respective layers, point of compass, wind rate, state of barometer, thermometer, &c., all of which may be in writing if for few copies; for many, the writing should be copied and printed in carbon, to be transferred to the negative for printing with that in one operation.

The "Topic" next week will be—"Landscape Photography," by H. P. Robinson.

Reviews.

The Hand-Book of Photographic Terms. William Heighway. (*London: Piper & Carter, 5, Castle Street, Holborn.*)

"A long-felt want," as advertisers say, seems to be met in Mr. Heighway's compilation; or, at any rate, if the want has not been felt, the "Hand-Book of Photographic Terms," when you have once glanced through its pages, certainly starts the idea how very strange it is that such a book has not been produced before. Mr. Heighway's work is in the form of a compact little dictionary starting with the word Aberration, and ending with Zn., which we are told is the chemical symbol of zinc. Everything in the world of photography that professionals or amateurs may require, seems contained in the little volume, which explains and describes most of the methods in modern use; and as all words and processes are arranged in alphabetical order, no time is lost in hunting for the information.

From the fact that photographers, like painters, actors, and literary men, are drawn from all trades and professions, they generally lack information in one branch or other of the art. If they have entered the world of photography through the door of chemistry, then it is an acquaintance with the canons of art they usually need; while, if the camera has been adopted in place of pencil or brush, then their chemical knowledge is apt to be weak. Mr. Heighway's hand-book supplies just the information all classes desire, information which, frequently from a feeling of false shame, they are unwilling to demand from their brother photographers. The "Hand-Book of Photographic Terms" should not only find a place in the photographic laboratory, but a place where your hand can reach it at any moment.

Chadwick's Patent View Shutter.

Mr. Chadwick's shutter, for which we are also indebted to Messrs. Marion, of Soho Square, has some points in common with the clever contrivance of Mr. Cadett. The Chadwick shutter is rather simpler than the latter; but then, on the other hand, it is scarcely capable of such fine adjustment.

The exposure in the Chadwick shutter is brought about, as in the Cadett apparatus, by a revolving disc, having a segment cut out of it, so that when this opening in the disc travels over the lens, the exposure takes place. The quicker the disc revolves, the more rapid will be the exposure. A spring determines the rapidity with which the disc revolves; a moveable nut is advanced or receded, and thus bends back the spring with more or less force, and obviously the greater the force of the spring, when the shutter is released, the more quickly the disc revolves, and the more rapid will be the exposure. The contrivance, therefore, is really exceedingly simple, and the revolution of the disc, let it be ever so swift, is effected without vibration to the camera.

One thing, however, the photographer should be careful about, not only if he purchases the Chadwick shutter, but any of these contrivances in which the action of releasing the shutter depends upon a nicely-adjusted nut or catch. If the latter act too stiffly, or too easily, the working of the apparatus is at once placed in jeopardy; the purchaser should, therefore, assure himself that this, the key of the apparatus, is in proper working order. Messrs. Marion and Co. are well known as careful manufacturers, and, therefore, there is little precaution necessary in respect to apparatus issued by that firm; but still the point is one that photographers will do well to bear in mind.

THE SCIOPTICON MANUAL. Fourth Edition. Revised and Re-written by George Smith. (*The Sciopticon Company*).

THIS is a useful little manual, telling us not only about the sciopticon, but about lanterns generally, and, moreover, giving much information upon the subject of producing photographic transparencies for lantern exhibitions. Several novelties are contained in the new edition, not the least important being a chapter on the subject of employing the lantern in a lighted room or daylight.

THE FERROTYPE—HOW IT IS MADE.

BY W. HEIGHWAY.

VI.—FERROTYPE TROUBLES

THE faults commonly ascribed to the plates are generally due to manipulation; still some plates have been found faulty, and it is well to be able to trace out the cause.

Black spots when they appear on any plate cut from one sheet, used at the same time and with the same chemicals (others being free from the spots), must clearly be attributed to a defect in the manufacture of the plate—probably some impurity of iron communicated by the baking oven, or the vessels used in the preparation of the varnish.

Metallic stains are also due to the plates at times; but oftener to faulty manipulation.

Whenever anything goes wrong in the gallery, it is so easy to cry out against the plates. First, distrust yourself; there, most likely, is the offender. The plates are not often wrong. If it remedied matters to say the plates are bad when they are not, we would have no objection—you might hang a few stock dealers, for aught we cared. Unfortunately, however, it would not mend matters.

The plates should be cut into suitable sizes to fit the holders. This must be carefully done, as it is an annoying and risky task to cut a plate when collodionized and sensitized; and still more annoying to be compelled to discard one on account of its being too small.

Many failures in the process are due to greasy fingers contaminating the fine, susceptible surface of the plate. These marks of grease are difficult to remove, even if the operator is aware or suspicious of their presence.

The plate, being cut in proper sizes, must then be cleaned with alcohol, rubbed over with cotton flannel, and polished with a clean piece of the flannel. Old, dirty, and stiff flannel should not be used, as it is likely to scratch and injure the delicate polish of the plate.

Collodion films should be cleaned from the surface of rejected or spoiled plates before they dry, and the plates carefully re-polished with alcohol. Stains of water on the surface are sometimes difficult to remove.

Plates, when clean and ready for use, should be placed together, face to the wall, a sheet of paper covering them to preserve them from dust; or a better plan will be found in keeping them in a convenient box with a hinged lid.

The tints of the brown plates may be used to suit the different complexions, but to a certain extent only. Photography, with all its exactness, can only be expected to represent—not reproduce. Beyond representation is caricature.

THE cleverest operator will at times find himself in trouble; but, if he is aware of the cause, the remedy is generally to be found close at hand. The cause of failure is not always carelessness, but very, very often it is.

Pinholes generally are the first plague to worry the operator. The cause and remedy have already been given in Chapter VII. If, in the hurry of business, a change of bath is not easy, relief often may be secured by placing the plate the reverse way on the dipper—*i.e.*, collodion side downwards—and withdrawing the plate immediately it is perfectly sensitised.

Metallic Scum has already been spoken of as being sometimes the fault of the preparation of the plate; it is also attributable to unclean plates, and to the impurities in the bath.

Fog may be caused in several ways—the collodion, the plates, bath, developer, light shining upon the lens reflection from objects other than those being photographed, reflection from the outside ring of the camera, the camera-box admitting light, the dark spring of the holder not being light-tight, actinic light in the dark-room, &c., &c. Carefully seek out the cause, and apply the required remedy. The troubled operator should first make sure that he has found out the source of trouble before proceeding to remedial measures, or he may get deeper into the fog. Doctoring the bath does no good in stopping a fog caused by a leaky camera.

Black Spots—transparent holes in the film—are sometimes caused by particles of dust adhering to the plate. Perhaps the plate was not brushed before collodionizing.

Comets are little particles of dust which have fallen on the surface of a coated plate, probably in the bath. Remedy: filter the solution clear. The bath-holder should be always covered when out of use.

This defect is often caused by a dirty plate-holder or camera, particles of dust being set flying on drawing back the dark-slide.

Perpendicular Lines or Streaks are caused by too rapid immersion of the plate; sensitizing before the film is properly set; by the bath being out of harmony with the collodion. Old and decomposed collodion often streaks in this way.

Hesitation Lines occur where the passage of the plate into the sensitizing solution has been arrested.

Crawling Lines are caused by the uneven flow of the developer over the plate. When the bath is charged with alcohol and ether the film repels the developer, so that it will not evenly cover the plate. Add alcohol to the developer, or evaporate the alcohol and ether from the bath.

Crape Markings are caused by water in the collodion. For remedy see Chapter III.

Divergent Lines, starting from the point where the developer was poured on, are caused by too violent application of the ferrous sulphate solution. It should be gently and steadily poured over the plate from the corner where the film is thickest, that whence the surplus collodion flowed back into the bottle.

White Spots may arise from an excess of nitric acid in the bath.

Slipping of the Film.—Generally from dirty plates.

White Circles sometimes mark dirty plates.

Oily Spots and Lines appear on imperfectly-sensitized plates.

Thick Ridges and Waves are caused by collodion which is too thick to flow properly. Thin the collodion with equal parts of alcohol and ether.

Veils of Scum are caused by the developing action being too rapid.

Veils are also caused by the developer being too slow of action.

Scum on the bath is often caused by the contaminating influence of the gutta-percha dipper.

Miscellaneous Hints to Strengthen an Over-developed Picture.—Where the development of a picture has been carried too far, or the exposure was a little full, the picture may be strengthened by adding iodine to the fixing solution, and pouring it over the picture or portion of the picture affected.

Take in a graduated measure an ounce of potassium cyanide solution of the ordinary strength for fixing, and add to it one drop of tincture of iodine. Wet the film thoroughly with water, and drop the solution on the parts which are over-developed, or, if universal, pour over the entire plate. For instance, with the picture of a lady in a black velvet dress the face may have been over-developed in the endeavour to get a little detail in the dress. A drop of the solution on the face may redeem a bad picture.

Potassium Cyanide.—The effect of cyanide on some constitutions is very serious. The dangers are in every case greatly enhanced by uncareful usage.

For the sake of health, comfort, and the success of the work, it is necessary that each time after fixing a picture the hands should be well rinsed under the tap.

Cut and chapped hands are particularly susceptible to the poison. A cut should be securely covered with plaster, the best being shoemaker's wax, melted and spread on a piece of a kid glove; to apply, gently warm the waxed side, and press down. The flesh must be quite dry.

Chlorine water, 5 parts; chlorohydrate of ammonia, 2 parts; sugar water, 250 parts; forms an antidote in cases of poisoning with cyanide, but the dose must be taken immediately, as the poison works rapidly.

If an operator suffers from the effects of cyanide, he should be careful not to inhale the fumes, and, after touching a plate wet from the fixing bath, he should place his hands in a weak solution of iron.

Waste of Silver.—A comparatively small percentage of silver remains in the finished picture, the rest being wasted in a large number of galleries—some because the business done is so small that it is not worth while to save; and in others because the business is so large it can afford to waste.

With a large or small gallery the silver waste must form an important item. If allowed to run away, of loss; if carefully preserved, of gain.

Try saving the silver by developing over an old felt hat as suggested in Chapter I. It will encourage you to begin saving on a larger scale.

Waste of all kinds is worse than foolish—it is wrong. Thousands of pounds are annually thrown away by photographers in this one item alone.

COLLODION GELATINE EMULSION.

BY H. L. T. HAAKMAN.

The different hints on this subject given in various numbers of the News induced me to try my hand at the composition of a collodion gelatine emulsion. I first dissolved 1 grain pyroxilin in a mixture of 50 cub. cent. alcohol and 50 cub. cent. glacial acetic acid. The solution was beautifully clear, without any precipitate. Then I made a bromide of silver gelatine emulsion as per Dr. Eder's formula:—

Water	50 cub. cents.
Bromide potassium	4 grammes
Nelson's No. 1 gelatine ...	7½ "
Nitrate of silver (redissolved in ammonia)	5 "

This emulsion was left to set, when cold pressed through a bag of canvas, washed, and precipitated in alcohol, rewashed in alcohol, and left to dry. The result was a very finely-divided emulsion in the form of very small globules, which did not stick together. Of this dry emulsion 5 grammes were added to 100 cub. cent. pyroxilin solution, and the bottle, containing both, and heated to 90° or 100° Fahr. When the emulsion was dissolved, it was filtered through flannel in the usual way, and six plates (7½ by 4½) coated with part thereof. The plates had been covered with caoutchouc dissolved in benzine.

The emulsion ran over the plate like collodion, but the film was full of specks and impurities. The films refused to set, although the weather was cold (I made the trial the first day of January), and I left the plates for about half-an-hour on glass plates in my dark-room, where I have no fire. The emulsion ran partly from the plates when I took them up, and only left a very thin film, probably consisting of the pyroxylin. Consequently the films were very streaky, and had that peculiar look of gelatine emulsions where the proportion of gelatine is too small, and the bromide of silver precipitates. A few days later I had occasion to try these plates when dry in the camera, using a pair of Dallmeyer's (1860) stereoscopic lenses, No. 5 diaphragm. The day being dark, and some parts of the subject non-actinic, my exposures varied from five to seven seconds. The ferrous-oxalate developer gave an exceedingly weak picture, too flat to be of any practical use. A considerable addition of bromide to the developer mended matters a little, but still the result was bad.

After these trials, I thought the emulsion was deficient in gelatine, and therefore I added the remaining dry gelatine emulsion powder. The contents in the bottle had solidified, but they soon melted in a tepid water bath, when the remainder of the dry emulsion was added. The solution only took place to a certain extent, and the resulting emulsion was rather lumpy from swollen gelatine, which refused to dissolve. With this emulsion I prepared another half-dozen plates, which, although better than the first batch, still presented the same faults—want of setting power, streaky and speckled film. I exposed on the same subject a snow scene, with the above mentioned lens; the exposures varied from nearly instantaneous to ten seconds, and on development there was not much difference in the resulting pictures, which, however, were all very weak.

It may be that Nelson's No. 1 gelatine is too soft for this purpose, and that with French gelatine I may succeed better; but my experiments agree entirely with those made by Mr. Wilde, in Górlitz, who says, in the just published No. 205 of the *Photographische Correspondenz*:—"According to my experience, the setting of the film, and the drying of the film, are not at all accelerated by, and both take place more rapidly without, the addition of collodion. I never got a preparation which was as rapid as ordinary gelatino-bromide emulsion without the collodion. The strong smell of acetic acid was exceedingly unpleasant," &c.

I have not hesitated in communicating my failure, as the subject is quite new, and well worth ventilating. Perhaps one of your numerous readers and experimentalists may work the process with better success, and show me where I blundered.

ACTION OF THE ACID DEVELOPER ON HIGHLY SENSITIVE BROMIDE EMULSION PLATES.

BY DR. H. W. VOGEL.

It is well known that the modern gelatine bromide plates of high sensitiveness are in general developed with the so-called alkaline developer. The question as to the action of the old acid developer for these plates (pyrogallic and citrate of silver) may be difficult to answer, because red fog arises very easily, and the consequence is, no result at all.

This difficulty can be avoided by employing collodio-gelatine emulsion. The film is at least as sensitive as the best gelatine plates in the market. I have prepared now plates five times more sensitive than the best wet plates, measured with daylight. These new plates do not fog with the ordinary pyrogallic and silver developer. I tried the latter, and was somewhat surprised to find a very slow action. I exposed an emulsion plate four, five, six, and ten times as long as I do for a normal development, but got no picture at all with the acid developer; finally, with an exposure of *fifteen* times as long as necessary for alkaline developer, I got a picture with pyrogallic acid and silver solutions.

In this way I determined that really the modern emulsion plates, under acid development, are only a trifle more sensitive than the collodion emulsion plates prepared with an excess of bromide. For collodion emulsion plates prepared according to Warnerke's formula, I found that for acid development an exposure is necessary only three times as long as for alkaline development. Therefore, if we had never known the latter developer, we should never have called the modern emulsion plates highly sensitive. My opinion is that these last-mentioned plates are not more sensitive to light, but more sensitive to any alkaline developer, than the ordinary collodion emulsion plates. It seems that the green modification of bromide of silver contained in the gelatine is more difficult to reduce, and if exposed to light it is more easy to reduce by ammonia and pyrogallic, than an ordinary modification of bromide of silver.

◆

PHOTOGRAPHY AT THE MELBOURNE EXHIBITION.*

The display of photographs throughout the various courts, though somewhat scattered, is extensive; and while far from being representative of the present status of the art-science of photography, is certainly miscellaneous enough. Silver printing appears to be almost universally practised in the colonies. Some few examples of carbon printing are shown here and there, the most considerable contribution coming from Sydney. Ceramic photography has one representative in Mr. Nelson R. Cherrill, Christchurch, New Zealand, formerly a partner of Mr. H. P. Robinson, of Leamington and Tunbridge Wells, who enjoys a European reputation for his artistic compositions, "Bringing home the May," and many other works. "Opaltype" is seen in some very indifferent specimens; and the "Powder-process," so great in the hands of Robert Faulkner and others, has no representative in the colonies.

In portraiture, we remark that altogether a high standard of excellence may be said to prevail in both Melbourne and Sydney. Retouching is extensively practised. The gelatino-bromide dry-plate process, which has in England, in a comparatively short period, revolutionised studio practice, has found one or two worthy adherents in Melbourne in Mr. J. W. Lindt and Messrs. Foster and Martin, who practise it with perfect success—indeed, in precisely the same manner and of the same standard of excellence as with the best London practitioners.

Framed portraits are exhibited by Messrs. Johnstone, O'Shannessy, and Co., Foster and Martin, J. W. Lindt, and N. Caire, of Melbourne. Many of them are of the highest standard—soft, round, well-lighted, with plenty of delicate half-tones, and free from hardness or chalkiness. If there is any fault to be found, we might say there is too little variety in the *pose*, a too frequent resort to stock attitudes, lacking in spontaneity and originality. Messrs. Matthews and Co., of Geelong, exhibit some good portraits. A large number of photographs of public buildings, townships, physical features of the country, &c., are displayed; some of them by Mr. C. Nettleton, of Melbourne, are good examples of this class. From Sydney we have enlargements by Boyd of Sir Henry Parkes and others, coloured, all of large size. Also a large composition, in which full-length portraits of the commissioners of the Sydney Exhibition are combined in one scene, representing the interior of a council-chamber or board-room. Mr. J. Hubert Newman, of Sydney, displays two enlargements. One, "The Water Fall, Govett's Leap, Blue Mountains," is very fine, and of the largest dimensions, 48in. by 24in. The other, "The Gorge, Blue Mountains," is not equally good. Mr. Bayliss exhibits a large collection of architectural subjects of large size (24in. by 18in.), principally of public buildings in Sydney. We cannot speak of them so highly as we desire. They all suffer from under-exposure—some of them markedly so. Messrs. Hart and Roux, of Sydney, exhibit the only examples of mechanical printing in the colonies.

South Australia displays a number of views of public buildings. Queensland shows some remarkable photographs of a tribe of "hairless blacks," taken by Baron Maclay, the Russian explorer. Tasmania, through the commissioners, exhibits views of Tasmanian scenery and public buildings. New Zealand sends a large contingent of photographs of scenery, public buildings, and portraits. Clifford and Morris, of Dunedin, send some good examples of their wook; Wrigglesworth and Binns, Wellington, make a large display; Hart, Cambell, and Co., Queenstown, Otago, find in the Lake Wakatipu districts abundant materials for the pursuit of the picturesque—the view from Hector's Creek, near the head of Lake Wakatipu, is a picture, though small in size. Their moonlight effects suffer from the suspicion always thrown on such unattainable subjects. A number of interesting views on Christchurch Road are exhibited by Hanwell Williams, of Greymouth. Some of the most artistic views in the New Zealand Court, by W. T. Locke Travers, F.L.S., Wellington, are printed so flat as to do great injustice to very fine negatives. Bartlett, Auckland, has some interesting views; and Burton Brothers, of Dunedin, display a number of views of large size printed in carbon. J. Bragge sends a very fine collection of photographs of Wellington. There are besides many interesting prints of native races, townships, &c. To a stranger, perhaps, the large frame of portraits of the House of Representatives will be most interesting, containing, as it does, the Maori members, looking very well in European costume, with their hair worn quite *en regle*—beard, moustache, Albert chain, collar and necktie, like gentlemen of the period. Fiji, judging from the excellent views by F. H. Dufty, Levuka, must be a pleasant land in which to live. The native portraits are of great value to the ethnologist. Ceylon contributes a large number of photographs of studies from nature, coffee plantations, &c. Belgium exhibits views of Bruges and its ancient belfry. The large photographs exhibited by the Minister of Public Works, France, remain in Victoria, being part of the liberal presentation made by the French Government. The façade of the new opera-house in Paris is a remarkably fine and useful acquisition. Others show the interiors of the schools of the Fine Arts, one of them entirely occupied by *moulages*, or casts. Also the Bibliothèque Nationale, the Conservatoire des Arts at Metiers, and that for the deaf and dumb—des Sourdes-Muettes.

The finest landscapes in the Exhibition consist of twelve Alpine views by B. Johannes, of Bavaria, placed in a remote part of the German court. Everyone interested in photography should see them. They are the best transcript that can be given (barring colour) of the indescribable majesty and beauty of Alpine scenery. Soft, yet forcible, brilliant, yet full of delicate gradation, the selection of the point of view, and balance of the composition, and mode of lighting—matters quite within the control of the photographer—are simply perfect. The geological configuration in some of them is admirably rendered. Italy displays two portraits of magnificent dimensions taken direct, and a number of Italian architecture, &c.

America displays some large portraits of General Grant, the Emperor of the Brazils, King Kalakua, Lord Augustus Loftus, and others, by Bradley and Rulofson, of San Francisco, and a large number of portraits by Tuttle and Co. People who desire, after the manner of Madame Rachel, to be made beautiful for ever, cannot do better than adopt this style. Retouching is carried so far as to completely deprive these presentments of men and women of all individuality of character.

When we remember that, as in water-colour painting, England stands supreme in landscape photography, we are constrained to say that practically the mother country makes no display in one of the most beautiful phases of English art. Vernon Heath's fine enlargements of "Burnham Beeches," from 12 by 10 negatives, "Windsor Castle," "View on the Thames," are all too well-known and admired to need expatiating upon here. Some very fine "studies," by George Nesbitt, F.S.A., of Bournemouth, are hung in the passage leading to the Commissioner's offices. "Crossing the Stream" is a picture in monochrome, hung out of reach. The three studies entitled "On Guard" (platinotype), "The Broken Leg," and "Tired Companions," have received the highest encomiums in England. They are all true to nature. There is no striving after the unattainable by photographic means, and consequently they are strong in that strength which comes of simple and legitimate aims. His "Brigands" are not so good; one can see they are perfectly harmless; and "Maiden Meditation" is too self-conscious, though good photography. Why these fine photographs should be here is one of those freaks of hanging that passes comprehension. Why also Colonel Stuart Wortley, of the South Kensington Museum—a most distinguished photographer—should have had all his large "Studies of Heads" and "Sea and Sky" relegated to the dark staircase of the picture gallery requires explanation.

---

* *Melbourne Argus.*

The general conclusions at which we arrive from a comprehensive survey of the exhibits is, that any adequate representation of the beauty of Australian scenery is yet a work for the future. Possibly there is not yet a sufficient demand to make it a remunerative undertaking. At any rate, there are no landscape photographers pure and simple. The views exhibited by Mr. J. W. Lindt are very beautiful—full of tender gradation and delicate half-tones; but they are limited in number.

◆

ON THE INFRA-RED LINES OR BANDS IN THE SUN'S SPECTRUM.

BY JOHN WILLIAM DRAPER, M.D.*

At a distance about as far below the red as the red is below the yellow in the solar spectrum, I found in 1842, in photographs taken on iodide of silver (Daguerre's preparation), three great lines or bands, with doubtful indications of a fourth still further off. I designated them as α, β, γ, and published an engraving of them in the *Philosophical Magazine* for May, 1843.

In 1846, MM. Foucault and Fizeau having repeated the experiment originally made by me, presented a communication to the French Academy of Sciences. They had observed the antagonizing action above referred to, and had seen the infra-spectral lines, α, β, γ. They had taken the precaution to deposit with the Academy a sealed envelope, containing an account of their discovery, not knowing that it had been made and published long previously in America.

Sir J. Herschel had made some investigations on the distribution of heat in the spectrum, using paper blackened on one side, and moistened with alcohol on the other. He obtained a series of spots or patches, commencing above the yellow, and extending beyond the red. Some writers on this subject have considered that these observations imply a discovery of the lines α, β, γ. They forget, however, that Herschel did not use a slit, but the image of the sun—an image which was more than a quarter of an inch in diameter. Under such circumstances it was impossible that these or any other of the fixed lines could be seen.

I have many times repeated this experiment, but could not obtain the same result, and therefore attributed my want of success to unskilfulness. More recently Lord Rayleigh (*Phil. Mag.*, November, 1877), having experimented in the same direction, seems to be disposed to attribute these images to a misleading action of the prism employed. Whatever their cause may be, it is clear that they have nothing to do with the fixed lines α, β, γ, now under consideration.

In these experiments, and also in others made about the same time on the distribution of heat in the spectrum, I attempted to form a diffraction-spectrum without the use of any dioptric media, endeavouring to get rid of all the disturbances which arise through the absorptive action of glass by using as the grating a polished surface of steel on which lines had been ruled with a diamond, and employing a concave mirror instead of an achromatic lens; and though my results were imperfect and incomplete, I saw enough to convince me that it is absolutely necessary to employ a spectrum that has been formed by reflection alone. (*Phil. Mag.*, March, 1857, p. 155.)

In 1871, M. Lamanski succeeded in detecting these lines or bands by the aid of a thermo-multiplier. He was not adequately informed on what had already been done in the matter in America; for he says that, "with the exception of Foucault and Fizeau in their well-known experiments on the interference of heat, no one as yet has made reference to these lines." Nearly thirty years before the date of this memoir, I had published an engraving of them (*Phil. Mag.*, May, 1843).

After I had discovered these three lines, I intended to use the grating for the exploration of that region, since it extends it far more than the prism can do—but, on making the attempt, was discouraged by the difficulty of getting rid of the more refrangible lines belonging to the second spectrum. I had hoped to eliminate these by passing the ray, on its approach to the slit, through a solution of the bichromate of potash. But the bichromate in long exposures permits a sufficiency of the more refrangible rays to pass, to produce a marked photographic effect; and hence I feared that any experiments supposed to prove the existence of lines in the infra-red would be open to the criticism that they in reality belonged to the more refrangible region of the spectrum of the second order, and that a satisfactory examination of the case would exclude the use of the grating, and compel that of the prism. With the prism I could not obtain clear evidence of the existence of more than three lines, or perhaps groups, and doubtful indications of a fourth. If in these examinations we go as far as wave-length 10,750, the limit of Captain Abney's map, we nearly reach the line H^2 of the third spectrum. This would include all the innumerable lines of spectrum 2, and even many of spectrum 3. In such a vast multitude of lines, how would it be possible to identify those that properly belonged to the first, and exclude those of the second and third spectra? Besides, we do not encounter the objection that this is altogether beyond the theoretical limit of the prismatic spectrum?

This brings us to Captain Abney's recent researches, which, by the aid of the grating, carry the investigation referred to the prismatic spectrum as far below the red as the red is below the yellow. They are not to be regarded as an extension of exploration in the infra-red region (for they really do not carry us beyond my own observations in 1843), but as securing the resolution of these lines or bands into their constituent elements. I had never regarded them as really single lines; the breadth or massiveness of their photographs too plainly suggests that they are composed of many associated ones. The principle of decreasing refrangibility with increasing wave-length incapacitates the prism from separating them; but the grating (which spreads them out according to their wave-length) reveals at once their composite character.

In Captain Abney's map, after leaving the red line A, we find three groups:—(1) ranging from about 8150 to 8350; (2) from 8930 to 9300; (3) from 9350 to 9800. These, admitting that the lines of the subsequent grating-spectra have been excluded, are then the resolution of α, β, γ.

I suppose that care has been taken to make sure of that, either by absorbent media or by a subsidiary prism. If the grating had been ruled in such a manner as to extinguish the second spectrum, inconveniences would arise from the characteristics thereby impressed on the first.

In the phosphorographic spectrum on luminous paint, this vast multitude of lines is blended into a mass which probably can never be completely resolved into its elements, on account of the propagation of phosphorescence from particle to particle. I have resolved it into two or three constituent groups, and frequently have seen indications of its capability of resolution into lines, in the serrated aspect of its lateral edges.

I believe that luminous paint enables us to approach very nearly, if not completely, to the theoretical limit of the prismatic spectrum.

The history of these interesting infra-red lines is briefly this. They were discovered by me in 1842, and an engraving and description of them given in the "Philosophical Magazine." They were next seen by Foucault and Fizeau in 1846, and a description of them presented to the French Academy of Sciences. They were again detected by Lamanski with the thermopile in 1871. Their resolution into a great number of finer lines was accomplished by Abney, who gave a Bakerian lecture describing them before the Royal Society in 1880. Finally they have been re-detected by me in the shining rectangle, just above the theoretical limit of the prismatic spectrum, given by many phosphorescent substances.

---

* Philosophical Magazine.

◆

Correspondence.

THE MELBOURNE EXHIBITION.

Sir,—In your issue of the 7th January, Mr Lindt, of Melbourne, favourably notices our pictures at the Exhibition. The photograph of the Native Boat he alludes to was taken by Mr. Wilkinson, as were also three others—viz., Colombo Harbour, Hindoo Temple, and Kandy; all the others (41 subjects—12 by 10 plates—collodion), including the *instantaneous sea views*, were taken by Mr. Skeen.—Yours truly, W. L. H. Skeen & Co.

Colombo.

A TEMPORARY FOCUSSING-SCREEN.

Sir,—The following simple plan will be found efficient for replacing temporarily a broken focussing-screen. A piece of glass lightly daubed over with glazier's putty will give a surface that leaves little to be desired. The grain can be light or dense by using hard or soft putty.

A Subscriber of Eleven Years.

TREATMENT OF NEGATIVES.

Sir,—Will you allow me space for a few words suggested by a paragraph in the interesting paper read by Mr. Brightman before the Bristol and West of England Amateur Photographic Association. I quote the following from your report in the News:—

"Having a great dislike to the use of hyposulphite of soda in the dark room, I have always considered the necessity of fixing before exposure to the light. One of the drawbacks of the gelatine process, in all directions, for the development of gelatine plates, the necessity of fixing before allowing the light to have access to the plate, is strongly insisted upon. I, however, find in practice, that if the developer is washed from the plate, that light has no further action on the film. As a proof of this I produce several negatives, all of which were fixed in full daylight; yet the shadows are, in every case, perfectly clear."

I have no doubt that if the whole of the pyrogallic were eliminated from the film, light would have no farther effect. But that the plate is still sensitive to the action of even a moderate amount of light after it has received the usual amount of washing which precedes treating with alum, or placing direct in the hyposulphite bath, is, I think, shown by the result of the following experiment:—

A gelatine plate was exposed in the camera, and developed in the usual manner with pyrogallic. It was then washed for a minute or two, then replaced in the dark slide, the shutter was drawn half up, and the whole was taken into bright diffused daylight for ten seconds. After fixing the plate, there was a distinct difference between the two halves. Either standing alone would have passed for an unusually clear negative; but on placing the plate face downwards on a piece of white paper, the half which had been exposed to light was seen to be considerably more yellow than the other half. Doubtless, had the plate been placed in an alum solution for some time, the yellow stain would have disappeared; but it is evident that the light had had an effect, and it is not to be supposed that the alteration it produced was for the better.—I am, sir, yours, &c., W. K. Burton.

Proceedings of Societies.

Edinburgh Photographic Society.

The third popular meeting this Session was held in Queen Street Hall, on Wednesday, the 9th inst. The programme for the evening was a series of views taken by Mr. Andrew Pringle during several months' sojourn in Italy. Mr. Pringle delivered a very interesting lecture, and described the different scenes as they passed before the audience.

Mr. Dobbie proposed a vote of thanks to the Lecturer, which was heartily responded to.

Photographic Society of Ireland.

The annual Lantern Exhibition was held on last Friday evening in the Lecture Theatre of the Royal College of Science, Dublin, when a very large number of members and their friends were present.

The first part of the entertainment consisted of views from negatives by members, and these were followed by a fine series of pictures, the work of Mr. F. York, of Notting Hill, London, who kindly lent them for the occasion. His series of the animals in the "Zoo," and the English cathedrals, were particularly admired.

To Correspondents.

*** As a package of "Answers" has recently been lost in transmission through the post, those correspondents who have not been attended to are requested to repeat their queries.

Radix.—See leader in our issue of last week.

J. Garland.—There are several firms in London who do this class of work, among which we may mention Messrs. Leitch and Co., and the Typographic Etching Co., both of Farringdon Street.

J. H. T. E.—1. Why not write direct to the firm you mention? 2. Quite possible, if properly prepared plates are used, and the light is favourable. 3. The distance is estimated, and the focus set accordingly; but when the lens is adjusted for a range of twenty-five feet, all objects at a greater distance are sufficiently sharp in most cases.

Bradford.—See Mr. Heighway's articles on Ferrotype.

Yalnif.—1. Solder the flange to the nose of the lantern, taking care that the axis of the lens corresponds with that of the nose tube. 2. About 4½ inches in diameter, and no reflector is required in the case of the lime-light. 3. The lens is not likely to be injured by use with the lantern.

J. T. R.—1. Probably the end of September. 2. We are afraid publication will debar its chance of success.

B. B. (Wolverhampton).—You cannot do better than get Abney's "Emulsion," post-free from our publishers, 1s. 7½d.

C. E. G.—1. Very excellent burnishers are to be obtained from most photographic material dealers, but we cannot recommend any special make. It may be mentioned, however, that failures in burnishing prints more frequently arise from careless manipulation than from defects in the instrument. 2. It will keep, under favourable conditions, for many months—the best method of preserving it being in tin cases, each sheet being rolled in a piece of paper which has been moistened with a weak solution of sodium carbonate, and dried. 3. The instrument devised by Mr. Warnerke is sold by Messrs. Marion and Co., of Soho Square.

H. H.—It is impossible for us to say which is the better lens, unless you inform us as to the kind of work you intend to do. If you wish to do portraits and indoor groups, as well as general out-door work, we would hardly advise you to make the exchange.

T. P. B.—1. Thin tissue paper will answer the purpose very well, and if you carefully select a suitable sample the rapidity of exposure will be very little affected. Long exposure to light generally darkens paper somewhat, so a change must be made occasionally. 2. Test the various samples by exposing a piece of sensitive paper under them.

A. Peirce.—The only book on the subject is now out of print.

F.—1. We have little doubt that the fault rests principally with the negative, but there are signs of an over-thin ink having been used, and it is quite possible that your stone may not have been free from every trace of gummy matters when the transfer was put down. 2. It may be used several times, but its cost is so small that it is scarcely worth while to incur any risk of failure by keeping it too long. 3. The compound in question is very variable in its composition, and we do not know of any rough-and-ready test of strength, excepting the intensity of its smell. 4, 5. Yes. 6. No.

F. Dunsterville.—1. No doubt it would answer very well, but a careful preliminary cleansing would be necessary; at the same time, we should not expect to find much difference as regards general qualities of the pyroxyline. 2. The latter can be obtained from Messrs. Wratten and Wainwright, Great Queen Street, W.C., and they will probably obtain the other for you.

J. Nicholls.—The address you give is quite sufficient, but we do not think he will part with them.

Moisture.—A gas stove on the calorigen principle is best suited to your requirements, as in this case you will obtain a stream of warm air which has neither been vitiated by carbonic acid nor by aqueous vapour.

Carrie.—You will find it by no means easy to adapt your old-fashioned camera to your present idea. You had better obtain an entirely new instrument.

J. M. Bonsor.—1. About thirty grains of loaf sugar to each ounce. 2. A temperature of about 120° Fah.

L. T. J.—We believe that Captain Abney has made some experiments bearing on the matter in question, and we hope to learn particulars before long.

Shellac.—It deteriorates rapidly by keeping: why not use the unbleached article?

Rollo.—Such conduct is most reprehensible, and is calculated to bring the photographic profession into disrepute. Make the enquiries you suggest, and let us hear again.

Hermann.—We fear that you will not meet with much success; but you can try, at any rate.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1177.—*March* 25, 1881.

CONTENTS.

PAGE
Hyposulphite in the Oxalate Developer.................... 133
Coloured Photographic Miniatures.................... 133
Measuring the Sunbeams once More.................... 134
Notes on Photography and Art. By Edwin Cocking.................... 135
By-the-Bye—On Groups.................... 136
Notes.................... 137
Topics of the Day—Landscape Studies. By H. P. Robinson... 138
Self-Luminous Photographs. By Dr. J. M. Eder.................... 139
French Correspondence. By Leon Vidal.................... 140
Art Photography. By Payne Jennings.................... 141
Action of Light upon the Soluble Iodides.................... 142
Correspondence—Popularising the Woodbury Process—Gelatine *v.* Collodion.................... 143
Proceedings of Societies.................... 144
Talk in the Studio.................... 144
To Correspondents.................... 144

HYPOSULPHITE IN THE OXALATE DEVELOPER.

We are indebted to Captain Abney for the discovery that a little hyposulphite in the oxalate developer is not only harmless, but that it in some cases possesses positive advantages; he had observed that gelatine plates were developed more rapidly and more intensely in those places which he had touched with his fingers. On enquiring into the cause of this phenomenon, he bethought himself that shortly before manipulating the plates he had been working with hyposulphite, and that probably traces of this latter substance had remained in the pores of the skin. A repetition of the experiment confirmed the truth of this surmise, and the property of hyposulphite to act as an intensifier was put out of doubt.

About the same time the photographer Tracy Wilde, of Goulitz, conjointly with his daughter Melanie, made the same observation independently, without knowing anything of the work of Captain Abney; both experimenters lighted by chance on the same fact. In the latter case a basin was used for the developing solution in which some negatives out of the fixing bath had been laid to be rinsed; by this means a very slight trace of hyposulphite had got mixed with the developing solution. Now, as Wilde published his observation later than Captain Abney, the right of priority of course belongs to the latter; Wilde, however, was the first to make known a reliable formula for this developer.

We have ourselves repeatedly experimented with the oxalate developer containing a little hyposulphite, and have obtained good results, not only on iodo-bromide plates, but also on pure bromide plates, as well as on bromide plates containing a slight admixture of chloride. In all cases, and especially in taking portraits, the developer to which a little hyposulphite had been added was found to be superior to one of the pure oxalate.

It must be observed, however, that the addition of hyposulphite must be made with the greatest possible care, or the whole solution will be spoilt; the hyposulphite must be employed only in extremely small quantities. The developer will be found to work extremely well when to two ounces of the oxalate solution there are added from ten to forty drops of a very weak hyposulphite solution (1 : 200). In this solution the image develops in a few seconds, and can be continuously developed until it shows the requisite intensity. By this method not only is the time of development reduced, but the duration of the exposure is also considerably shortened; the negatives are rich in detail, and show very delicate gradation in the half-tones. A special advantage consists in the fact that the negatives do not get hard and have no sharp contrasts, as is so often the case with negatives developed by the ordinary oxalate, a fault of which portrait photographers have often complained. The addition of potassium bromide as a restrainer is not necessary; but it can be used when it is wished to increase the transparency as well as the intensity of the contrasts.

The less hyposulphite one uses, the richer will the negatives be in contrasts; and the more hyposulphite, the softer they will be. We have, therefore, in our power an excellent regulator, which enables us to obtain very various effects. For this method, both the oxalate developer obtained by boiling, as well as that made by mixing, as in Dr. Eder's formula, can be employed.

When the developing solution contains too much hyposulphite, the negative will be fogged, or it is even inverted in the development, and changed into a positive; this happens when a few drops of concentrated hyposulphite solution are added instead of the above recommended very dilute solution. In this case the image develops at first in the ordinary way, but it becomes suddenly inverted, and there is produced a very imperfect positive, containing parts that have kept their negative character, and which is generally fogged. In one of our recent numbers, Mr. Wilmer drew attention to this last named circumstance. Whether the expectation will be fulfilled of arriving by this means at the production of duplicate negatives we are scarcely in a position to decide. In the meantime our experiments in this direction have not given very satisfactory results.

◆

COLOURED PHOTOGRAPHIC MINIATURES.

One occasionally meets with a small paper portrait which has been mounted, face downwards, on the inside of a hollow glass by means of varnish or some transparent medium, the back of the print being roughly coloured by means of oil paints. The varying degrees of artistic excellence met with in the case of such productions are as wide from each other as may well be possible; but we are sorry to say that in the majority of instances the miniatures in question range very low indeed in the artistic scale. This may probably arise from the circumstance that many unqualified practitioners adopt such methods with the notion that by means of them they will be able to turn out artistically coloured work, although they may be utterly devoid of that artistic instinct which is invariably needful for the production of any result worth looking at, or of that training which is generally required to curb and direct the artistic impulse.

We now propose to give simple directions for the production of the class of work in question, but we wish our readers to distinctly understand that this process, like every other method of colouring photographs, requires the exercise of artistic skill, and if this is absent, the results will be as ugly as any other work of the same nature into which the true artistic element does not enter.

The first point is to obtain suitable concave glasses, these being something like oval watch glasses; and they can be readily obtained, being much used for covering a variety of small ornamental articles, such as mounted samples of seaweed or cheap plaster bas-reliefs. It is well, however, not to select glasses which are too deep, on account of the difficulty of making the pictures set well down without creases.

The negative from which the print is made should be rather thin than dense, and the print is made on ordinary albumenized paper, a dark grey tone being most suitable. The picture is next slightly tinted on the front with water colours, special attention being given to those parts which cannot be advantageously treated from the back, and after this the print is thoroughly dried, and placed in a small tray containing the following mixture maintained at a temperature about equal to that of boiling water:—

Canada balsam	4 ounces
Spermaceti	3 ,,
White wax	1 ounce

The glass is next warmed to a slightly higher temperature than the mixture, and the picture, which by this time should have become quite transparent, is placed, face downwards, in the required position, the excess of resinous mixture being got rid of by the use of small squeegees made of cork, these being worked from the central portion outwards. During the operation it is, of course, necessary to maintain a sufficient degree of heat to keep the mixture in a state of fluidity, a Bunsen burner or a spirit lamp being convenient for this purpose. The glass being once more cold, and its face having been cleaned by means of turpentine, it will be found that the print has lost all its vigour, and presents a cold, pale, and washed-out appearance; but all its pristine vigour can be restored by pressing any white body into close contact with it at the back. Before this backing up with a white body—or even white paint—is done, the various colours must be laid on; and for this use the ordinary tube oil colours are well adapted. When the colouring is finished, and the paint is dry, it merely remains to back up with flake white.

The results obtained by a method of this kind well repay the labour expended when the work is done by a moderately-skilled artist; and we omitted to mention that tints of the original print may be lowered in part by rubbing down with the finest flour glass paper, or even by cautious erasure with a pen-knife.

MEASURING THE SUNBEAMS ONCE MORE.

"We have already," says another number of *La Nature*, "described an instrument invented by an English physicist and meteorologist, Mr. David Winstanley, for the purpose of recording the radiation of the sun. This first apparatus has been completely transformed by its inventor into a new system much more complete, and which ought, it would seem, to solve, in a manner altogether satisfactory, an important problem well worthy the attention of meteorologists. The new radiograph of Mr. Winstanley consists of an air thermometer the stem of which is circularly curved, and the two reservoirs of which, A and B, are united. The reservoir B is coated with lamp black, while the other remains transparent. The tube contains a certain quantity of mercury, as shown in our engraving, fig. 1. The air thermometer is fixed to a circular support of brass, which rests on a knife-edge in such a manner as to be capable of oscillating after the fashion of the beam of a balance.

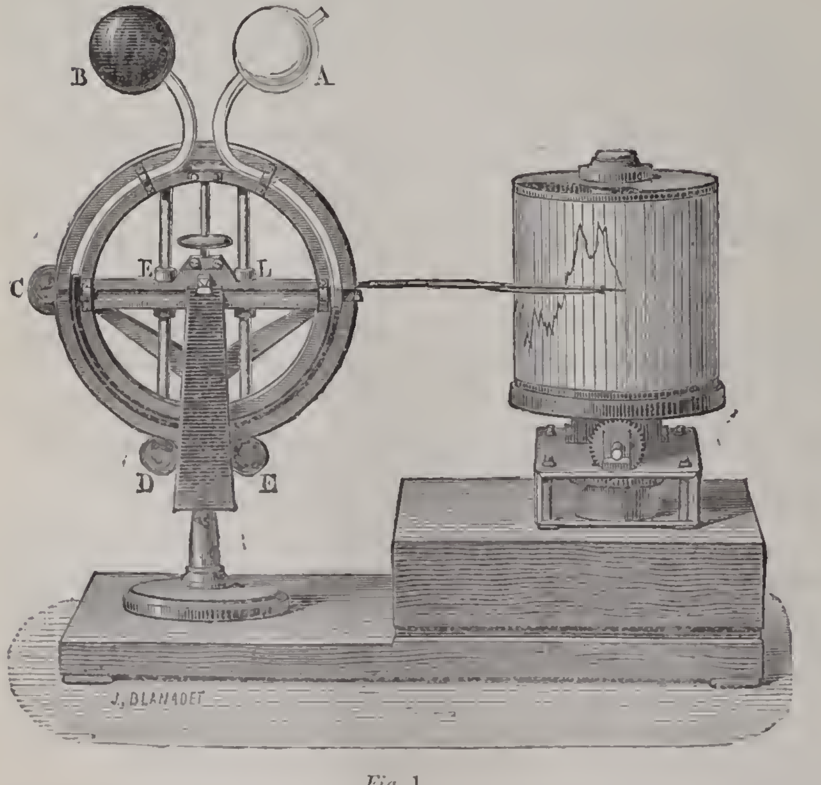


Fig. 1.

Fig. 3.

"Suppose the system to be in equilibrium, and the bulbs A and B to be exposed to any possible solar radiation, if the sun should shine, the air contained in the black bulb B expands, and forces the mercury along the tube; but at the same time the mercury, in being thus displaced, inclines the system, the equilibrium of which has been disturbed. If the wheel of brass is furnished with a stylus fixed at the extremity of a lever, this stylus becomes more and more depressed as the solar radiation becomes more and more intense. There results then a series of movements on the part of the stylus which may be inscribed upon a sheet of smoked paper rolled around a cylinder rotated continuously on its axis by a clock-work movement, as shown in our engraving. The disc C serves to counterbalance the weight of the inscribing stylus, whilst the others, D, E, which can be moved together with the stems to which they are attached, are intended to elevate and depress at will the centre of gravity of the balanced system."

The radiograph, when used, is enclosed in a box of copper, its bulbs projecting upwards into a dome of glass. The whole has hitherto been fixed upon a wooden stand (as shown in fig. 3), the legs of which are firmly imbedded in the ground, and in this condition it weathered out on the lawn of Government House, in the Isle of Man, the heavy gales which blew between the 17th and 24th of April last. The diagram reproduced in fig. 2 is a specimen of the tracings yielded by the radiograph. It will be seen that the sun's rays were felt for at least two hours and a-half before his time to rise, for the needle has already left the datum line.[*]

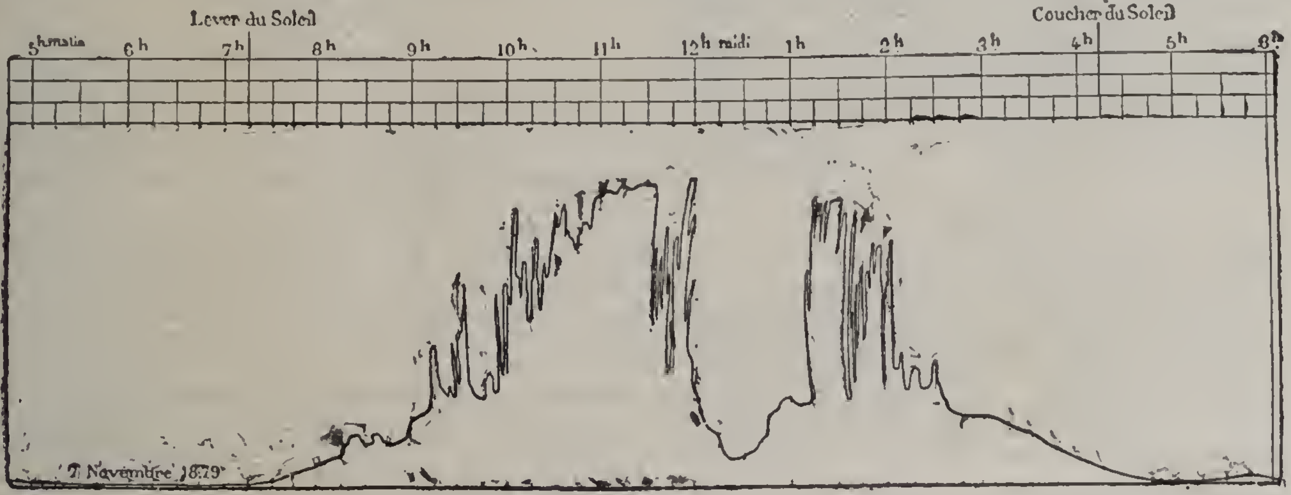


Fig 2.

From a quarter past seven to nine o'clock the solar rays gradually increase in power, though they evidently penetrate clouds of varying opacity. At nine o'clock there is a sudden gleam, lasting for perhaps five minutes, or somewhat less. Then follows a light and varying cloud; then another and a briefer gleam, and another and a briefer cloud, and so on up to twelve o'clock at noon, when the sun shines with his greatest power for only some four minutes time. Then follows a very big cloud lasting for an hour and fifteen minutes, varying in its opacity, and at one time almost bringing with it the gloom of night. Then follow other gleams and further clouds, until at length, a little after sunset, the radiation stops, to be renewed again in feebleness for a brief period an hour and-a-half after the sun is down. This nocturnal radiation is a curious fact, and constitutes, in our opinion, a remarkable discovery. It generally attains its maximum at the noon of night, when one would certainly imagine the terrestrial receipt of solar radiation to be at its least. That this is a fact is testified by Mr. Whipple, the director of the Observatory of Kew,[†] and Mr. Winstanley considers it attributable to the feeble refraction of the upper air, which, in his opinion, bends a small fraction of the solar radiation right round the earth, and at a spot which has the sun upon its nadir; this radiation, streaming in from every part of the horizon, forms what may be termed a thermal and an anti-solar pole. We shall be very pleased to learn how this view may be corroborated by experiments in those regions of the tropics which lie at midnight in the ecliptic plane, and where, consequently, should this hypothesis be true, the phenomenon will be exhibited in its greatest phase. However this may be, there can be no doubt that by the invention of the radiograph, Mr. Winstanley has performed an important service for the science of meteorology, and we congratulate our old contributor on the success he has attained.

◆

NOTES ON PHOTOGRAPHY AND ART.

BY EDWIN COCKING.[‡]

In an address delivered at Leicester last December by Mr. H. Herkomer, A.R.A., he is reported to have said, "A photograph can always interest, but can never charm; it is for ever cut off from art." Also, in an extract from a letter by another member of the Royal Academy, Mr. H. Stacy Marks, A.R.A. (inserted in the February number of the Journal of this Society) it is stated, "I experienced pleasure in seeing the various works, and noting what strides were being made in the art." With these two extracts before us, I propose to make some remarks bearing upon the question of art in photography.

And first, I wish to call attention to this—that as long as two modes of producing a picture—viz, by the art of the painter and the art of the photographer—are placed together upon the same platform to be criticised, the comparison is not just, because the photographer, who is compelled to do so much by mechanical and chemical means must, to a certain extent, be at a discount, so that I think it cannot be too frequently enforced that the two arts never can run upon the same lines, and, to carry out the simile, never can arrive at the same terminus; and it is because the same terminus is sought to be arrived at by so many photographers, that so much misunderstanding and opposition arise in the minds of artists and critics respecting the status of our position in the art world.

Both arts start with the ultimatum of a picture, and in photography I contend that by its aid there can be produced, not only pleasurable emotions, but that such pictures also *charm* the beholder; at the same time, it must never be forgotten that thousands of photographs are produced which bear no trace of art in them at all. Parallel to this, there are many works produced by painters which show only the results of manipulative skill; but to those who really know the workings of both arts, it will be conceded that the manipulative skill of the painter occupies a more important position than that of the photographer.

Now the production of a pictorial work involves the study of composition, light and shade, and expression, and all these *can* and *must* be studied by the art photographer as well as the artist; but the means used in the respective arts to produce good results totally differ, and here arises one of the principal matters at issue, the individuality of the works produced.

A few words to elucidate this may not be out of place. The painter arrives at his individuality by impressing upon his *work* a certain something which is *outside* and very far beyond the mechanical means he uses, and this proceeds from a mental and idealic power which then depicts the *effect* which a face, a figure, a group, a landscape, or any other object has upon him, and this passing through the idiosyncrasy of his individuality enables him to *create* what is called a work of art.

---

[*] The diagram has been reversed so that the line is shown as rising with an increase in the intensity of the solar rays, although in its inscription it descended, owing to a constructional oversight, on which it is needless here to dwell.

[†] See YEAR-BOOK for 1881, p. 121.

[‡] Read before the Photographic Society of Great Britain.

On the other hand, the photographer works *within* his mechanical means (and to a certain extent they bind him in chains), and his individuality consists in impressing the *objects*, whether a face, figure, &c., with his mental idiosyncrasy; and further, he must actually *see* before him the total picture before he can do anything at all, so that the photographer's individuality consists in selecting rather than in creating. Hence it follows that at the very time the painter is copying or imitating what is before him, there is going on simultaneously an outcome of individuality, so that several painters might be working on the same subject, but would produce results diametrically opposite to each other; several photographers also working simultaneously on the same subject will produce results not so very different from each other—it being, of course, supposed that both painters and photographers are perfect masters of their respective implements. If such be the case, it goes to prove the position that the two Arts must be looked at, criticised, and appreciated from different standpoints, and therefore, whilst both should be designated Art, yet neither has any right to condemn the other because it does not produce the same result.

Then also the photographer meets with obstacles and difficulties which the painter knows not, and it is just those matters, which sometimes cannot be quite overcome, that constitute the difference between the two Arts. There is another matter which it would seem to a great extent will stand in the way, and that is the culture which each exponent undergoes towards making himself master in his respective Art.

The painter cultivates both his mind and his hand by slow but constant means, in order to express his after sensations of what is beautiful or expressive, and eventually his mechanical means become his slaves. The photographer either does not or will not cultivate his mind or art feeling through the dictum of art rules, whilst eventually he finds that his mechanical means sometimes make him their slave, and so the outcome is, that means are wasted upon mere facsimile transcripts, which, if guided by cultured art rules, would have resulted in a pictorial work.

In discussing this subject, there is one important factor in Art, which it is self-evident is utterly beyond the power of photographic Art to grasp, and that is "ideality," and it is this important matter which sometimes impels the painter to make the realism of photography its only merit, and therefore totally outside the ranks of Art.

I venture to say that Art in photography must stand by itself, because it differs so completely from all other imitative arts; so that there will always be a wide gulf between them. For instance, the painter uses lumps or washes of coloured matter in the form of marks or signs which he has to put together bit by bit, and these signs suggest the original objects to the beholder. On the other hand, the photographer uses the originals themselves to impress, not marks or signs, but a perfect facsimile of their forms, together with their light and their shade, and this is being done all over the entire picture at the same instant of time; and so the beholder looks at a photograph expecting to see Nature's self reproduced, only without colour. If, then, to this can be added the charm of artistic selection and arrangement of the form and light and shade, surely this must result in a work of Art entirely and completely standing by itself!

Admitting, then, that photography never can idealize, cause the resulting picture to be other than a facsimile of what thousands can see at the moment the negative is being taken—how incumbent it is that the photographer should study to make that picture as artistic as possible!

The time has arrived when it ought to be discerned by photographers that art feeling is as capable of growth and cultivation as manipulatory skill, and that if it be found impossible for Art and Science to be simultaneously studied by the same individual, a distinct separation must be made between the two studies, and at the same time a *want* must be supplied, and that is, a method for giving Art instruction to the future photographer. We have plenty of properly qualified persons who can investigate and disseminate the mechanical and chemical appliances peculiar to photography; but it is being realised now that we require some special instruction in photographic picture making, and it is inevitable that the instructors will eventually arise from the painters, who must possess a knowledge of the means used, and will then be enabled to show, step by step, how composition, light and shade, and the consequent expression arising therefrom, can be studied; so that instead of wasting years upon the chance of working out any latent Art tendencies by slow and incompetent ways, a thoroughly organised school for Art photography will become as necessary as any laboratory which now exists for the acquirement of scientific knowledge.

When this is done, and the world at large sees that photographic pictorial works are produced resulting from artistic training, then may photographic pictures assume an independent position in the Art world. We have had examples in our midst of some whose art tendencies have been strong enough, without any special training, to enable them to produce works which have pointed the way to greater possibilities; but such particular cases only point to the absolute necessity of special guides to show the way which, if entered upon with enthusiasm, will ultimately lead to success.

By-the-Bye.

ON GROUPS.

The photographer may divide group-work in two classes: one class, in which he has to deal with a multitude of models at the shortest notice, as in the case of wedding-groups, club groups, society groups, university groups, &c.; and the other, in which half-a-dozen, more or less, of a family require to be depicted. As regards the former class, from the nature of things, the result may usually be predicted a certain failure as an artistic work; for even if the photographer possesses qualifications for his task in the highest degree, he is powerless to employ them in the few minutes at his disposal. All he can hope to secure under the most favourable circumstances is a picturesque grouping of the company, marred more or less by incongruous costumes and awkward poses. In a word, the photographer—if he is permitted—must quickly convey to the company a general idea to be carried out, and hope for the best.

But it is different with the other class of groups, and it is of these we intend to speak. There should be no haphazard work here; the group picture we refer to is one that is frequently called for, and would be demanded more often still, if photographers could but satisfy their customers.

A family group is one of the most difficult tasks to undertake; so difficult, indeed, that some photographers refuse it altogether. Still, it is work that must be done, for a time arrives sooner or later in the tide of affairs when paterfamilias desires a picture of those nearest and dearest to him. The cost of such a picture is, in many cases, a matter of secondary consideration. The family begins to be scattered—the daughters marry, the sons are working for homes of their own; a few years longer, and there may be a void here and there in the circle. They meet together still, at long intervals, under the paternal roof; but father and mother best know how rare these opportunities grow as time wears on. An effort has now to be made to assemble the whole family, and on this occasion it is—may be for the last time—that the photographer's aid is invoked to depict the family group.

Now, the principal fault we find with photographers in taking pictures of this kind is, that they do too much, rather than too little. They are too anxious to please, and so over-do it. The aim is generally taken too high, and the picture misses its mark. Everybody in the picture seems so intent upon doing something, that you cannot but think they are only making-believe: the group is overloaded with incidents.

Sometimes we get a group of six individuals busily engaged in six different tasks or pastimes. One is pouring out tea, another playing the violoncello, a third knitting, a fourth painting, &c., &c., and all of them hard at it, too. It surely is a most remarkable coincidence that just at the moment when Charles is beginning to play, Maria to raise the teapot, Lucy to knit the baby's socks, and Tom to lift his brush with a view to putting in the sky of a water-colour sketch, that a photographer, of all men in the world, should have popped in with his camera, and depicted the happy family then and there. It is apparent, from the picture, that they must have been taken unawares, so terribly busy are they all. Or, stay—does it not remind one rather of Praed's lines, in which the poet describes the effects of a morning call by the village magnate?

> "Whene'er they heard his ring or knock,
> Quicker than thought the village slatterns
> Flung down the novel, smoothed the frock,
> And took up Mrs. Glasse or patterns.
> Alice was studying baker's bills;
> Louisa looked the queen of knitters;
> Jane happened to be hemming frills;
> And Nell, by chance, was making fritters."

It may be said, in explanation, that it is Charles' avocation to play the violoncello, that Tom is a painter, that Maria always presides at the tea-table, and Lucy looks after the little ones' wardrobe. We have not the least doubt about it, only it will be difficult, we think, to get their friends to believe that they are always hard at it in the manner depicted.

The fault, as we have said, lies in overdoing the incident. Group pictures, as a rule, suffer from too much incident rather than too little. The object in view should be a singleness of purpose; to show that even in the event of this one or that one being engaged upon some occupation, the occupation is subordinate to the general motive pervading the picture. No doubt the arranging and successful carrying out of such a group-picture is a difficult task; but then the achievement of success always is difficult. The first thing is to have some well-conceived notion in your mind; the next, to carry it out.

Portraitists, whether they are successful painters or successful photographers, make a study of pose; when they see a graceful posture or pleasing position in a gallery or collection, they study the posture and acquaint themselves with the reasons that have contributed to make it graceful and pleasing. Those ready with their pencil are for ever sketching outlines of this figure or that, to be elaborated hereafter on canvas or paper. On two occasions—once in the Tyrol, and once in Italy—we were so fortunate as to have as companion on our travels a clever artist, who brought back with him from the tour several score of sketches of character, to serve as hints in picture making. Here were three old peasants leaning over a bridge smoking long pipes, and chatting; here a railway guard forcibly gesticulating before an erring passenger; here an old woman comfortably asleep beside her stall in the market place; here a group of boys watching the post wagon while the horses are changed. Whenever our friend saw a bit of character, a pose or attitude that was quaint or original, he noted it for future use. He did not mean to create the poses in his next picture, but copy them out of his vast collection.

In the same way, photographers should glean information on the subject of groups. It is not enough to carry in the mind's eye certain ideas or schemes; they should make a note of every picture that pleases them, and study to imitate its virtues. Paintings of groups there are in plenty, engravings or photographs of which are accessible; and also photographs now and then that would well repay study and analysis. From Germany have recently come several group-photographs embodying good ideas; one of these may well be described. It represents paterfamilas' birthday; and birthdays in Germany, especially in connection with the head of the family, partake something of an official character. There is a presentation of gifts and felicitations, not in a promiscuous fashion, but with something of pomp and circumstance. Papa sits in the drawing-room in state, and receives the birthday procession, headed by the little ones and mamma, while the rest of the family gather round. Some have gifts and flowers in hand; but all are there with the same object—that of wishing many happy returns of the day. The group is so successful that, for the moment, the idea or incident has more weight with the spectator than the portraits; and yet it was simply for the purpose of securing the latter that the little scene has been presented.

Another picture—this time the production of the famous house of Loescher and Petsch, of Berlin—may be also briefly mentioned before we quit the subject. This is a group of mother, son, and two daughters. The eldest daughter, standing, is reading a letter containing some important news, for her sister looks over her shoulder, while her mother, sitting in an arm-chair knitting, stays her hand for the moment, and looks up; the son, too, a newspaper in his hand, ceases from his reading to listen to the epistle. Here, as in the other picture, the spectator wonders what can be in that letter to interest, rather than looks at the group as a mere collection of portraits. There is a main incident, and there are lesser incidents, but the latter are not permitted to force themselves upon the attention of the spectator, and the result is a composition full of motive, and yet quiet and subdued in character.

The "At Home" next week will be "A City Phototype Establishment." The following "By-the-Bye" will be "Vanity Fair."

Notes.

M. Janssen, the well-known astronomer, has performed a clever *tour-de-force*. He has taken a photograph of the dark portion of the moon—or, in other words, of the moon illuminated only by light from the earth. The moon was three days old at the time, and, therefore, there was but a narrow rind of brightness, the rest of the disc in shadow being but faintly visible. It was of this shadowed portion that M. Janssen obtained a photograph, with an exposure of sixty seconds, upon a gelatine plate. The photograph, we are told, exhibits the general figure of the lunar continents.

Sir John Lubbock's exertions in the way of preserving ancient monuments are likely to be crowned with success. Sir John Lubbock suggests that any one contemplating the destruction of a monument upon his land should be compelled first to offer it for sale to the country. In photography, Sir John has a valuable ally in the preservation of ancient monuments.

Barnard's Inn is about to be pulled down, and should not be forgotten by the Society for Photographing Relics of Ancient London. By-the-bye, we wonder if the Society in question has yet secured pictures of the old Hackney coach and sedan chair which were familiar objects in our streets down at the beginning of the present century. They would be relics well worth photographing!

Messrs. Morgan and Co. have been good enough to forward some specimens of their gelatino-bromide paper It is rather late in the day to bear testimony to its utility as a ready means of enlarging, but we cannot do less than express our entire satisfaction both with the simplicity of the process and the results. The pictures may be likened to those upon collodio-chloride paper, and the tone reminds one a good deal of a fine steel engraving, so rich and delicate is it.

In one respect it is fortunate that the next meeting of the Photographic Society takes place on the second Tuesday in April, and not as usual on the first in the month, since the 5th prox. is the date fixed for the delivery of the Faraday lecture at the Royal Institution by Dr. Helmholz, of Berlin.

Dr. Eder, in another column, tells us how self-luminous photographs may be made pictures, we believe, first brought to the notice of photographers by Mr. Woodbury.

A point to be noted in connection with the history of photography. Mr. C. H. Talbot, writing from Lacock Abbey, in reference to his late father, Fox Talbot, says:—"It is hardly correct to say that he was the *eldest* son of Mr. William Davenport Talbot, as he was the only issue of the marriage, his father having died when he (Fox Talbot) was a few months old."

Dr. O. Lohse communicates to the *Archiv* the following simple method of preparing a most sensitive and pure bromide of silver, which may be added to gelatine, or even collodion. Chemically pure bromide of potassium is dissolved in sufficient water, and mixed with one-eighth the quantity of gelatine necessary to form the finished emulsion, the gelatine, after soaking, being dissolved by slightly warming the mixture. Nitrate of silver in crystals is now added in the dark, and the mixture boiled for half an hour; while still hot, as much acetic acid is added as may be deemed necessary to make the gelatine fluid. Poured now into cold distilled water, a bromide of silver is obtained so finely suspended in the water as scarcely to be collected upon a filter paper. After standing some days, however, the bromide is deposited, and the water containing the gelatine and refuse salts is poured away. Finally, a little ammonia is added to counteract the acetic acid. The operation of washing is altogether avoided. To make gelatine emulsion, you simply shake up the bromide with some warm gelatine.

The Copyright Bill now being drafted by the Law Amendment Society is to be more liberal than its predecessor. Copyright in paintings, pictures, and photographs is "to last during the life of the artist, and for thirty years after his death." The copyright is to begin with and depend upon registration, which is no longer to be at Stationers' Hall, but in a Government Office to be established and maintained for that purpose.

In the case of photographs, engravings, prints, or similar works, copyright is to mean the exclusive right of multiplying copies of the works protected, whether by photography or otherwise, so that it is very certain a painter cannot copy a photograph any more than a photographer can copy a painting. If the producer of a picture sells it, the copyright is still retained by the producer, unless otherwise stipulated; but in the case of likenesses, these are not to be reproduced by the artist who owns the copyright, without the consent of the purchaser.

A combination of photography and human nature. An old flyman and his steed were employed pretty frequently by the "young master" up at the Hall in conveying a portable dark room to a neighbouring stream where pretty pictures grew. The old man looked and longed so often at the camera, that, in the end, the squire promised to take a picture of both man and beast, if they came to him the first fine day. The photograph was taken, and the flyman presented with half-a-dozen copies; but still he stood there touching his hat at the door, with something on his mind. "Well, good day, Jarvis; I don't want you to-morrow, you know, so you needn't call." Jarvis touched his hat again, and intimated, as he had done once before in the interview, that he and his horse had been photographed. "Of course you have, Jarvis, and those are the pictures; I'll make you a present of them, you know. Now, is there anything else?" Jarvis saluted awkwardly once more, and then added, "Well, sir, I wanted to know who was to pay us for our time."

Topics of the Day.

LANDSCAPE STUDIES.

BY H. P. ROBINSON.

1.—An Effect of Light.

Spring is come! She may at first, perhaps, be mistaken for winter. But she is here! A beautiful sunshiny day in March coming upon us after an unusual continuance of exceptional winter horrors, such as we have had to endure this year, brings the subject of landscape photography before us with a suddenness that is almost startling. A few days ago strong faith was required to make it seem possible that nature would ever revive, or that the sun would become visible any more; to-day, the beauty of the weather brings on that "landscape fever"—that yearning for a journey into the country, camera in hand—which every photographer who has tasted its delights must feel in the early, fine days of the spring.

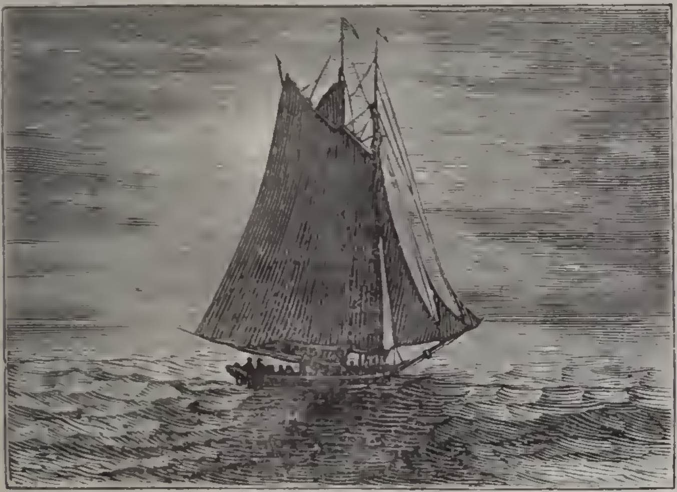
The question arises, what are photographers going to do with landscape in the future? In the old wet or dry collodion days—the days of albumen, honey, treacle, beer, tannin, tents, and other abominations, now fast falling into the limbo of oblivion—their aims were limited and circumscribed by their materials; subjects only that could be relied on to remain quiescent for at least twenty seconds, for pictures of any size, except in very exceptional cases, such as well-lighted sea-views, could be counted on with any certainty to give satisfactory results; but now the conditions under which the photographer works are entirely altered; his plate is dry, therefore he is not in a hurry; he can wait for his effects; all landscapists can remember how they have waited for the sun or the wind till they have, in sheer desperation, and in fear of the film drying, or oyster-shell markings appearing, exposed their plate with no chance of obtaining a good negative; the twenty seconds exposure has suddenly collapsed to two, and—"Ah! the difference!" But this is not all. The two seconds is now reckoned amongst the rather long exposures, and conditions of light and shade and subject so often suggest a much shorter time—if time it might be called when time is almost abolished—that no landscape men who thoroughly understand and appreciate the possibilities of gelatine plates, and can get the utmost of which they are capable out of them, care to go afield without some means of making instantaneous exposures amongst their *impedimenta.* A vastly more extended range of subjects is now open to photographers. Figures can be introduced without fear of the negative (otherwise perfect) being spoilt by movement

It is not now necessary to wait for a breathless day to take trees. I once watched a subject containing willows in the near foreground for two years before I found it still enough for a large negative. Cattle, sheep, and other animals may be permitted to adorn foregrounds. Mr. Mayland has shown us that the fretting and fuming of hundreds of steamers in the Thames is rather conducive to pictorial effect than repulsive to the photographer; and what is, perhaps, as important as anything else, every variety of light and shade may be attempted with a fair hope of success. This brings me to the one particular phase of landscape on which I have a few words to say.

In looking through a collection of landscape photographs it will be noticed that nearly all of them are lighted from the side, or with the source of light more or less behind the camera. I know there are exceptions, but few attempts will be found at what is sometimes called "daring" effects. They are all decorously well lighted; but such a thing as a photograph with the sun in front of the camera—in the teeth of the lens—is seldom seen; yet no better opportunity for striking and picturesque effects than this treatment affords exists. I do not mean that the sun should be visible in the picture, although this is not impossible or improper, but that it should be in front—as, for instance, in a sunset. The luminary might be hidden behind a ruin, as in Turner's wonderful "Norham Castle" in the *Liber Studiorum*, or by a tree, as in many of Turner's and Claude's most successful pictures, or behind a cloud; or it may be so high in the heavens as to be without the field of the picture, but yet have an influence on the clouds and landscape.

Notice the beautiful perspective effect of long shadows of tall trees as they run from a distance up to your feet. Even ugly nature is sometimes made picturesque and enjoyable by the way the light is thrown upon it. The portraitists have found this out, and applied it in the wrongly-called "Rembrandt" pictures, though they sometimes overdo the effect, not knowing the artistic value of reticence and sacrifice; even the poet has noticed the value of shadow when turned towards the spectator. Everybody must remember the rich attorney's daughter, who had arrived at a very mature age; the magic of light and shade seemed to make her young again—

> "You really might take her for forty-three
> In the dusk, with the light behind her."



The illustration will give some idea of what I want to convey. I have put the sun in to show the source of light; but, in a photograph, or, indeed, any other kind of picture, the sun itself would be better hidden behind the sail of the boat. In this arrangement we get the highest light opposed to the strongest dark, a very favourite form of composition among painters, and is an excellent expedient for securing powerful effects. By placing the extremes of light and dark in juxtaposition, a key-note is secured which accentuates the mass and contour of the object so relieved in the most powerful way, and gives the utmost limit of effect. By opposing—to borrow an illustration from a sister art—the extremities of the gamut of light and shade, the artist enables the eye to gauge and be sensible of the tenderest tones and semi-tones in other parts of the picture. By bringing the darkest mass of the picture, whether it consists of a boat, or a ruin, or a tree, against the lightest part of the sky, the value of each is enhanced, and a delicate sense of atmosphere and space is gained that would be difficult to produce by any other device.

It might probably be said that there are great difficulties in the way of obtaining landscape negatives with the lens turned towards the light. Well, there are difficulties. But what photographer, worthy of his camera, objects to difficulties, or would be deterred by them? To me, the taking of a subject by photography that presents no difficulties is one of the most tame and insipid ways of passing the time I know. A true musician prefers the violin to the barrel-organ, although it is infinitely easier to grind a tune out of the latter than to squeak a melody out of the former. Now what are the difficulties that present themselves? The lens, acting as a window as well as a lens, might admit sufficient light to slightly fog the plate; but I do not see any objection to a slight veil over the shadows if the negative prints the effect I require, and a good deal can be done by shading the lens during exposure. There are some photographers who care more about the mechanical or chemical beauty of their negatives than of the pictorial result. They think more of the means than the end. I differ from them. I don't want to preach up the beauty of fog; but I have seen prints from some fogged negatives containing beauties that I don't think could be given by negatives with clear glass in the darks, or in any other way.

Another bugbear is halation. This is certainly a very annoying defect; but it is not a fault that cannot be got over. Halation is the result of carelessness. I have never seen it occur, under the most trying circumstances, when the film of gelatine has been thick enough on the glass to give the best results in other ways. Last year I used some plates that gave this troublesome blurring, but they also gave flat lights and shadows; they would not register nearly all the tones in nature, from the highest light to the deepest dark; both defects arose from the maker having been too economical with his bromo-gelatine, and the film was thin and blue. Even these plates could be made to give images free—or almost free—from halation, by being properly backed with burnt sienna; but nothing could induce them to give the proper proportions of light and shade.

If there are other difficulties I hope my readers may meet with them, and enjoy them as I should do.

The "Topic" for next week will be "Photography and Art," by Lyddell Sawyer.

SELF-LUMINOUS PHOTOGRAPHS.

BY DR. J. M. EDER.

Self-luminous photographs are, at the present moment, attracting much public attention in Vienna. When these are examined by daylight they look like ordinary paper photographs; but in the dark they are beautifully phosphorescent in the high-lights, have a more or less feeble glow in the half-tones, and in the deep shadows possess no luminosity.

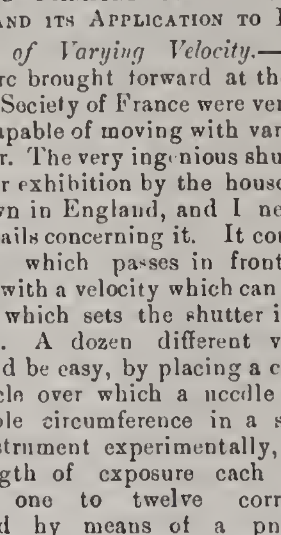
The preparation of these self-luminous photographs is very simple. A silver print on albumen paper, or a collotype, is rendered transparent by brushing over it a mixture of equal volumes of castor oil and oil of turpentine. The superfluous oil is removed by means of cotton wool or a linen rag, and the phosphorescent paint is then put on. The paper thus prepared is then dried, and afterwards mounted with its reverse side on cardboard. So soon as it has been exposed to the daylight, and the light penetrates through the transparent or semi-transparent parts, the phosphorescence of the luminous paint underneath is excited, and in the dark the image is seen with all its gradations; brilliant pictures, and moonlight landscapes, give especially good results.

These self-luminous photographs were first introduced to the Vienna public at a ball given by the chemical students of the Technical High School on the 3rd of March last. The ladies' ball programmes were decorated with a self-luminous picture, representing an alchemist at work in his laboratory.

FRENCH CORRESPONDENCE.

Rapid Shutters of Varying Velocity—Astronomical Photographs of M. Janssen and of M. Zenger—Major Waterhouse in Paris—Visit to the Copying Studio of the Ministry of Public Works—Autocopiste Noir and its Application to Photography.

Rapid Shutters of Varying Velocity.—The subjects of interest which were brought forward at the last meeting of the Photographic Society of France were very few in number; that of shutters capable of moving with varying velocity had the place of honour. The very ingenious shutter of M. Cadett, which was sent for exhibition by the house of Marion and Co., is well-known in England, and I need not, therefore, enter into any details concerning it. It consists of a circular plate of ebonite, which passes in front of the lens to open and close it with a velocity which can be varied according as the spring which sets the shutter in motion is more or less stretched. A dozen different velocities can be realised. It would be easy, by placing a camera in front of a graduated circle over which a needle moves so as to describe the whole circumference in a single second, to graduate this instrument experimentally, and thus to find out to what length of exposure each of the different velocities from one to twelve corresponds. The release is effected by means of a pneumatic pear, so that no vibration can be communicated to the camera during the exposure. M. Paul Boca, one of our most distinguished amateurs, has devised an instantaneous shutter in which the duration of the exposure is regulated by the fall of a metallic rod, T, either in air or in the cylinder C C′. In the latter case the lower extremity of the rod is attached to a piston, P, with movable sectors, so that the piston can be made more or less hollow. The rapidity of the fall would of course be less in proportion as the piston is less open. Thus, by removing one, two, or three sectors, we can obtain different times of fall for the same space passed over, and we shall know to what length of exposure each of these velocities corresponds. The objective, O, has in front of it, and kept in position by the frame, K K′, H″ H‴, two spring flaps, V V′, of which the one V′ left to itself, shuts of its own accord, whilst the other one, V, also left to itself, remains open. Now if this latter be closed and kept closed by the upper extremity, I, of the above-mentioned metallic rod, it will open of itself so soon as the trigger D moves the lever L′, which keeps the rod in its place, and the exposure will commence. The other flap, V′, is kept open by a lever, L, attached to a vertical arm, which is several inches lower than the objective. So soon as the metallic rod, T, in its fall. releases the lever L, this latter will no longer keep the flap V open, and it closes by means of a spring. The cylinder full of water, C C′, is suspended below the objective by means of the copper wires, A A′. It will be seen that the velocity of the fall, in order that the point I of the rod may arrive at the point I′, is regulated by the ordinary law of a falling body in space, provided that the rod T is free to move in air; but if, on the other hand, it carries the piston P more or less open, the velocity of the fall will be reduced in proportion as the opening of the piston is less. M. Paul Boca has graduated this instrument by means of a tuning-fork, one of the tongues of which carries a point; this point marks on steel ribbon, blackened with lampblack, the vibrations of the fork during the time of fall. In this way he regulates the height above the vertical arm, B, at which the lever L must be attached. It will be seen that by this very ingenious instrument the duration of the exposure can be very accurately determined. The objective is fully open during the whole time of exposure, since one of the flaps is opened at the commencement, and the other is closed only when the calculated duration has been obtained. It can be used for exposures of moderate rapidity, extending from the fiftieth of a second to two seconds and a half. For a greater rapidity it would be better to use another system. The only objection to the apparatus in its present form is its want of portability; but as the principle is a good one, the improvements of which it is susceptible to make it valuable for out-door photography are easily seen. By a singular coincidence, we were favoured at the same meeting with a sight of the shutter invented by MM. Stebbing and Collin, the construction of which is, in certain respects, similar to that of M. Paul Boca. It is based upon the principle of a spring which, pressing on the vertical flap of the shutter, communicates to it a greater or less rapidity of opening and shutting in proportion as the spring is in a greater or less state of tension. This is the same as in the circular shutter of Mr. Cadett, only that the two wings open from the centre towards the top and bottom of the lens, and close again by passing over the same path, but in opposite directions. It is a sort of guillotine with a double movement, but put in action by a spring, and not by a vertical fall. The lower wing is fastened by a vertical rod to a piston, which moves in a cylindrical tube full of air. So soon as the release of the trigger has set the apparatus in motion, the two wings open; the piston compresses the air in the tube; the compressed air escapes by a small aperture, and the length of the exposure is regulated by the rapidity with which the piston reaches the bottom of the cylinder, when the return movement of the wings closes the objective. In effect, the air in the cylinder acts as a cushion on which the piston rests, so that the time which elapses between the opening of the wings and the closing can be made as long and as short as is desired. By turning a graduated tooth-wheel the tension of the spring is regulated, and thus the duration of the exposure can be made to vary between about the half of a second and the hundredth part of a second. The apparatus can also be experimentally regulated by photographing a needle which moves on the surface of a frame, and noting the number of fractions of a second corresponding to each degree of tension of the spring. It may also be simplified by doing away with the looser tube of air, as the resistance which it offers to the movement of the piston is not of sufficient importance to render it always necessary. Without this appendage the apparatus would gain in portability. I



would therefore recommend that it should be used only in the case of cameras which are not to be carried about. We had, therefore, a very good evening with the shutters arranged for varying lengths of exposure.

Astronomical Photographs of MM. Janssen and Zenger.—Towards the end of the meeting some astronomical photographs, taken in the laboratory of Janssen, were exhibited, as well as some others taken by M. Zeuger. M. Janssen continues to occupy himself with improving the methods which photography places at his disposal of reproducing astronomical phenomena, and particularly the solar granulations, of which he has taken plates of very great interest.

Major Waterhouse in Paris.—Major Waterhouse has just passed a few days in Paris, and I had the pleasure of being introduced to him, and of carefully examining his photo-engravings taken by the process which was recently published in the PHOTOGRAPHIC NEWS. This process, like every other one at its first introduction, is probably open to improvement; but, judging from the work which has already been effected by it, it may even now take rank among the best methods of securing photo-engraved plates, especially of objects in which there are no light half-tones. Feeble prominences and depressions cannot be easily reproduced by means of an artificial grain. In saying this I speak under all reserve, for it may be quite possible to attain results of which we have as yet no conception.

Visit to the Copying Studio of the Ministry of Public Works.—I have been paying a visit to the workshops of the departments of maps and plans belonging to the Ministry of Public Works, and I am glad to be able to state that M. Mougel, the director and founder of these workshops, has brought to a great pitch of perfection the copying processes by means of bitumen, salts of iron, and bichromated gelatine. Not only have the processes themselves been greatly improved by his ingenuity, but he is also in a position to educate students for the service of Ponts et Chaussées, who, on their part, will be able to establish in the provinces workshops of the same kind. There are already eighty of these workshops established in France, and their number, which is still increasing, will probably before long reach two hundred. They are not photographic studios, properly so called, but they employ the principal photographic processes by means of which the reproductions of drawings and plans for the use of the service of Ponts et Chaussées can be rapidly and economically effected.

Autocopiste Noir, and its Application to Photography.—To those of my indulgent readers who are ignorant what the *autocopiste noir* means, let me explain that it is a sort of chromograph which gives impression in black lithographic ink, by means of a layer of gelatine on the surface of a piece of parchment paper. This parchment paper is coated with gelatine, and moistened for a couple of minutes. When it is dry, it is stretched upon a frame, very ingeniously constructed to give rapid and great tension. The manuscript is made on ordinary well-sized paper, with an ink of which the base is perchloride of iron. It is then transferred to the gelatine—as in the chromograph—by rubbing it gently with the hand. After this a roller charged with lithographic ink is passed over the surface of the gelatine, when the letters will be seen to take up the ink. A piece of white paper is then placed on it, pressed with the hand, and the impression is taken. The roller is again passed over the surface, another impression is taken as before, and so on, taking care to damp it from time to time with a sponge, if the ink should have attached itself anywhere than on the letters. I have myself tried this system of autograph, and have found that, by coating the parchment paper with a very thin film of gelatine, it was quite possible to take photographic impressions in fatty ink of line drawings; it is only necessary to sensitize the parchment paper with bichromate of potash. Instead of parchment paper, a glass plate coated with a thin film of gelatine hardened by alum can be used. The transfer is made as described above, and a black autograph is obtained without having recourse to a press. LEON VIDAL.

ART PHOTOGRAPHY.

BY PAYNE JENNINGS.*

IN placing before the members of this Society a paper on the art aspect of photography, I do so with some diffidence, as I am afraid that some members will not receive it with the wrapt interest and attention they have bestowed on the many valuable papers on scientific matters lately read before them. To me, however, I may at once confess, photography has only one absorbing attraction; I am pleasurably interested only in its art progress, and to me all scientific discoveries and technical formulæ are only interesting as aids in this direction. Any new process that will give extended power is, of course, a source of great congratulation, and I look upon it with the same pleasure as our brethren of the brush would do if they had presented to them by some scientific savant a new, brilliant, and permanent colour wherewith to enrich their productions and aid them in pourtraying the conception of their brains.

First, have we any right to be called artists at all? I think so. We have done enough already to deserve at least this, in spite of the war *à l'outrance* that has been waged against us by some unappeasable and untruthful critics. Secondly, do we deserve the unfavourable criticisms which have occasionally been levelled against us by honest and independent artists, who have seen the array of work displayed at our annual exhibitions, and who, of course, look upon these displays as the result of our utmost skill? To this question I would answer also in the affirmative, and I would further give it as my opinion that these gentlemen are often very merciful and forbearing, considering the provocation they receive, and it occurs to me that we might save ourselves much of this unpleasantness were we a little more strigent in what we allow to appear at our yearly show.

We have on these occasions an abundance of photographs, no doubt, but are we year by year increasing our reputation as artists? I doubt it. We must not forget the ease with which a photograph is produced. The task is certainly a light one: let us listen for a moment to, and examine the work of, a photographer a few days old. By following the instruction contained in his guide, he has been able, by the aid of his lens, camera, and dry plate, to produce a photograph technically perfect. "See!" exclaims our ambitious novice, "I have only had my *complete set* a week, and mark the result! So-and-so's lens, So-and-so's plate; *beautiful, ain't it?* I mean to go in strong for it this year, I can tell you: never thought it was so easy." The subject under notice is a view of the "old house at home" from the back garden, and the inevitable group that have been asked to stand "*just for a second*" adorn the greater part of the picture. There are mamma and papa, and brothers and sisters, not forgetting Master Tommy, who, like Pongo and the tabby, has been pressed unwillingly into the scene, and all three in their various positions are making frantic efforts to escape the gaze of the optic instrument. Mary Anne and the cook are also there ("for they are a happy family"), each holding tenaciously the insignia of their respective craft, and both staring with undisguised admiration at "Master 'Enery's" new machine.

It may be also worthy of notice (though not considered of any importance by the artist) that the broom-handle in the hands of Mary Anne is held in such a manner that the head of the gardener, which appears "over the garden wall," seems transfixed on the top of it. "The lens just caught him," exclaims our novice: "the man I bought it of *says it will do anything*, and between you and me and the post I believe he's right." He says this triumphantly, and no doubt our friend considers he has mastered all the tricks and arts photography can boast of.

So much, then, for the ease with which a photograph can be produced. Another older and more practical hand is of a different stamp. He has reached such a high standard of excellence that he is a yearly exhibitor at the Art Show. He sends a contribution there, the only possible merit it can be allowed being its extensive dimensions. The subject is perhaps a famous ploughing-machine, or a group of new chimney-pot ventilators, taken under great difficulties, but "*direct*, mark you!" exclaims our artist enthusiastically; "this is no enlargement."

I say the perpetrator of such a work ought, on taking it to an Art Exhibition, to be himself *taken direct*, and incarcerated in the Art Reformatory jail. The Hanging Committee should also be put on their trial as accomplices after the fact, and not dismissed without a caution. One word now as to the press criticisms in our own photographic journals. Do they not want reforming, too? We know that we all of us like a little "goody-

---

* **Read before the Photographic Society of Great Britain.**

goody" occasionally—it is so pleasant and soothing! But is it beneficial to our Art constitutions? I trow not; better to have the genuine medicine. I have been told before now by an exhibitor that he went into the arena of Art photography in fear and trembling, but, to his great surprise, came out a full-blown artist. He felt, when he entered, as though he would be figuratively "jammed to a jelly." He received, however, a bottle of "goody-goody," and was completely reassured. Another, had he received his deserts, would have been punished severely; he received, instead, a bottle of the flattering or soothing cordial, and became at once emboldened to do further violence. This gentleman is still at large, but the Art detectives have their eye on him, and he may be arrested at any moment.

This soothing cordial is, however, in reality a weakening medicine, and only leaves us in a poor condition to fight the sterner enemy: better to have a dose of the true and honest art-corrective. The story of one of these misguided gentlemen before mentioned would then read as follows:—Venturing too near the Photographic Fine Art Powder Mills, I was by a sudden explosion blown to a million of atoms. The first bottle collected my scattered fragments; the second fixed them well and firmly together; and after taking the third I was completely cured, and am now a worthy member of the Photographic Art Society.

One more word with respect to our annual gathering together of promiscuous photography, and I have done with that subject. Would it not be better to have it not quite so promiscuous, or, as a compromise, let not the mixture be quite so noticeable? At our art exhibitions we should, by careful supervision, separate as far as possible the dross from the precious metal, and present to the critic work of which none need be ashamed.

I would suggest also, that the time has arrived when all lovers of photography should band themselves together to protect and further as much as possible its art interest, to encourage and foster this, its highest and noblest aim, and deliver our art science from the reproach of a want of true art feeling.

Are we not rich enough in art strength to establish a Photographic Art Council, the members of which, by honestly criticising the various works presented to them, may educate the young student, and point out to him the path he should follow? These are questions which I am aware present more or less difficulties in their practical application, but nevertheless I think it will be acknowledged that the photographic art student looks in vain for that assistance which is at the disposal of other studying kindred arts. Leaving this question, then, to the consideration of those able and willing to deal with it, I will pass on to another of equal interest, viz.: How are we likely to succeed in our endeavour to obtain the sympathy of our artistic brethren? I myself would say, by attempting less, and paying greater attention to the work we undertake to produce, and, above all, to have a thorough knowledge of our subject; and, by the way, this is of the utmost importance—once let us conceive in our minds the result we aim at, and it will not be difficult to carry it out. No work will last or give prolonged pleasure that has not been the result of careful study, and the simpler the subject the greater may be its claim on true art.

Now, as to our shortcomings. A glance at the most noticeable of the faults observable in original photography generally will, I think, show that the chief of these (speaking of composition of *genre* pictures) is a want of connection or sympathy in the various figures or parts that make up the whole.

Photogragraphic attempts in this direction are often disjointed in the extreme, and unsatisfactory to a degree. How carefully this matter of harmony is considered by the great masters of art, is at once apparent by a glance at their productions; every accessory, every seemingly trivial object on the picture, is made to play an important part in leading up to and supporting the principal incident, and the observer is at once directed to the artist's meaning

This matter of connection and concentration cannot be too urgently insisted upon; the whole picture should be, above all, harmonious in its parts, and the eye should not (as is too often the case) be allowed to wander out of the picture or fall upon any object that will not help to tell the story it is intended to convey.

In photographic compositions we are often, as it were, on a voyage of discovery as to what is meant in the subject before us; every picture should have a meaning easily discernible, and, however simple the subject may be, will, if skilfully treated, not fail to give pleasure and satisfaction. Of course we know that there are often great difficulties in the way, but is it not creditable and honorable to overcome them? They have been overcome in many notable instances, and I am sure the artists have been well repaid for their study and pains.

In landscape work the path is, no doubt, not so difficult. In this branch of the art one great advantage, we hold, is our English atmosphere, giving us, as it does, such varied though evanescent effects, and rendering that indescribable charm to British landscape. We are thus greatly aided in rendering aerial perspective, without which no landscape can be poetically beautiful.

But, whether we wish to pourtray the bubbling brook or the foaming river, the peaceful valley or the rocky wild, or whether, on the other hand, it is our ambition to represent some domestic incident which appeals immediately to the heart, my object in this short paper is to emphasize the necessity of setting about the work with a proper spirit and appreciative feeling; let each student do this attentively and carefully, and I think we shall have fewer lashes from the censor's whip, and shall, at any rate, be less deserving of them.

I will conclude with the remark that it is, no doubt, a regrettable fact that, at present, photography does not take the position among the arts it undoubtedly should; but, as the poet reminds us, "Hope reigns triumphant in the human breast." Let us hope then and work with willing hearts and hands, acknowledge our faults and strive to overcome them, and then, I feel sure, we shall, little by little, break down the barrier that separates us from art recognition.

ACTION OF LIGHT UPON THE SOLUBLE IODIDES.

Outlines of a New Method of Actinometry.

Dr. A. R. Leeds, whose exhaustive labours in connection with the action of light upon the soluble iodides were the subject of a paper last year in the *Philosophical Magazine*, has now communicated to the *Chemical News* some further results he has secured during a lengthened research. The liberation of iodine by the action of light upon certain easily decomposed substances, and the measurement of the iodine thus liberated, has for some time past been regarded as the only promising basis whereon to found a true method of actinometry; and Dr. Leeds has made this the subject of diligent study. But oxygen as well as light plays an important rôle in the liberation of iodine in these actinometric experiments, and in his summary, Dr. Leeds says:—

1. The part played by oxygen is the essential fact in the decomposition of soluble iodides in acidified solutions, no decomposition taking place either in darkness or in the strongest sunlight, in case oxygen is absent. The principal exception to the rule is when nitric acid is employed.

2. In case oxygen is present, the reaction takes place according to the equation—

$$4MI+4HA+O_2=4MA+2H_2O+2I_2,$$

where M stands for any monovalent basic radical, and A a monobastic acid radical. This is true of the solutions both in darkness and in light.

3. In case sufficient oxygen is present to permit of a normal reaction, the amount of iodine liberated in the darkness is strictly proportional to the degree of concentration up to the limit to which the above equation is true. In the light the same law holds good; the surface of exposure and the quantity and intensity of the light remaining the same, the degree of concentration the variable.

4. In case sufficient oxygen is present and the degree of concentration is fixed, the amount of iodine liberated increases in the same ratio as the time of exposure to the light. There is likewise much reason for supposing that it stands in a similar numerical relation to the number and intensity of the chemical rays falling upon the solution.

5. With a constant actinic energy and with equivalent solutions of acids, the amounts of iodine liberated differ by constant quantities, which appear to be coefficients of comparative chemical energy of the acid radicals under these conditions. A similar law appears to apply to the various basic radicals of the iodides in the presence of the same acid.

6. In the absence of oxygen no decomposition takes place, either in light or darkness, nor in dilute nor quite strong solutions, when the solutions are *heated* for hours to a temperature 5° above the boiling point of water. In the presence of oxygen

instantaneous and abundant decomposition sets in at this temperature and correspondingly at lower temperatures.

Applications of the Iodo-Acid Method.—1. To determine the amount of chemical work done by the sun's rays while passing through various layers of the earth's atmosphere, either during each hour in the same day at any given place, or at different places for each day and season of the year. Curves representing such actinometric measurements at Hoboken for January 22 and 24, 1879, and February 27, 1879, are given.

2. To determine the absorptive coefficients for the chemical rays of the sun (or other powerful actinic light) of various gases, vapours, &c., under known conditions in the labaratory. and then apply the knowledge thus obtained to an actino-chemical analysis of the atmosphere.

3. To map the actinic spectra of the sun, electric, magnesium and other powerfully actinic illuminants and the absorption bands for the invisible rays, when the light from these sources passes through solids, mineral and organic compounds in dissolved or liquid form, and vaporous or gaseous bodies.

4. To determine the comparative coefficients of combining and decomposing power of elements in compounds subject to metathesis by actinic forces, and to find these actino-equivalents for invisible rays of various refrangibility.

After the extended account published in the June number of the *Philosophical Magazine* for 1879, and sent about the same time to different gentlemen in Europe, I was very much surprised when I saw an article published in the Chemical News, vol. xli, p. 211, being a paper read before the Royal Society, April 29, 1880, by Dr. R. Angus Smith, in which, beneath the title "Measurement of the Actinism of the Sun's Rays and of Daylight," he gives an account of a process, which in every point runs parallel with and coincident with my own, except in several important omissions. This, I think, will appear on consideration of the following resumé of Dr. Smith's work. He states:—"The fundamental fact is that when iodide of potassium in solution is treated with nitric acid, so small in quantity as to cause no change of colour in dull diffused light, a change takes place when the same mixture is brought into clear light; iodine is set free and the solution becomes yellow. The amount of iodine set free can be titrated with great exactness by the use of hyposulphite, as is well known. In these two facts lies the whole process, the first is the new part, the second makes the first quantitative, and it is of course part of the novelty."

I admit the novelty exhibited by Dr. Smith, in selecting, of all others, nitric as the acid forming part of the fundamental fact of the process as he states it. For it is true that in the 128 determinations of the iodine liberated from four iodides in the presence of sulphuric and hydrochloric acids and titrated by the use of standard (1 c.c.=5 m.grms. I) sodic hyposulphite and 1-10th standard, these 128 determinations being all made in one day, February 27, 1879, I did not use nitric acid. And the reasons for its omissions are stated in many places (2nd and 3rd papers). For, while the reaction in dilute solution (Eq. 2, §X., 3rd paper) for sulphuric acid is—

$$4KI+2H_2SO_4+O_2=2K_2SO_4+2H_2O+2I_2,$$

and for hydrochloric acid (Eq. 6)—

$$4KI+4HCl+O_2=4KCl+2H_2O+2I_2,$$

that for nitric acid is not only the normal one of—

$$4KI+4HNO_3+O_2=4KNO_3+2H_2O+2I_2 \text{ (Eq. 3)},$$

but the secondary ones, $2HNO_3=N_2O_4+H_2O+O$, of $2HNO_3$

$$\text{(in sunlight)} = N_2O_3+H_2O+O_2 \text{ (Eq. 4)}$$

$$\text{and } 2KI+2HNO_3+N_2O_3=2KNO_3+H_2O_2+N_2O_2+I_2 \text{ (Eq. 5)}$$

It had been abundantly demonstrated by many experiments (what was well known before) that nitric acid of itself, no iodides being present, spontaneously breaks up into one or more lower oxides of nitrogen and free oxygen in the sunlight, and generates in the body of the solution itself an abnormal supply of that oxygen, which, to my way of thinking, is the fundamental factor in these cases of actino-chemical change. Later on, Dr. Smith suspects that the nitric acid itself in dilute solution was subject to decomposition, and substitutes for his new and fundamental fact the use of sulphuric acid. I think Dr. Smith will grant that this is not new, inasmuch as he will find it stated at great length, *Phil. Mag.* for 1879, p. 396. Neither, however, is it fundamental, for an equivalent amount of hydrochloric acid possesses a greater coefficient of iodine-liberating power when placed in an actinic field.

(*To be continued.*)

Correspondence.

POPULARISING THE WOODBURY PROCESS.

Sir,—In the article in your last, under the above heading, I note that you recommended the use of Spence's metal as a simple and cheap method of making printing matrices for obtaining impressions by the Woodbury system of printing. My experience, extending over many years, leads me to think the contrary, as I became convinced long ago that no process of casting (no matter how fine the surface of the impression produced) would answer for the purpose. During several months I made a great number of experiments with sulphur (an analogous compound), the method employed being described at the time in the News (in 1865, I think), and although the most beautiful casts from medallions, &c., have been produced in this substance, I entirely failed to produce a suitable matrix for the purpose. Had I not at the time thought of trying what could be obtained by pressing the relief into soft metal analogous to the process then known as nature printing, I think it most probable that the process would have died a natural death at the time, and never been heard more of. For phototypographic and engraving processes, where absolute planemetric truth of surface is not an absolute necessity, I think the metal has a large future.

At the exhibition of medals held in Paris last year several ingenious uses were shown of it, including the covering the necks of wine bottles, for which it appears very suitable.

W. B. Woodbury.

GELATINE *VERSUS* COLLODION.

Dear Sir,—Owing to absence from home, it is only now that I have seen Dr. H. W. Vogel's letter in the Photographic News of the 11th inst. I trust in this letter the language I use may be neither "patriotic nor political," nor yet "scientific." I have nothing to say regarding any particular plate to be found in commerce. I simply reiterate that there are gelatine plates which are ten to fifteen times more rapid than a wet plate. I thought from his remarks that Dr. Vogel had one of the Warnerke sensitometers, since he explained that the want of intensity in them made them incapable of giving measurements in daylight. I see, however, that I was mistaken. I have several varieties of sensitometers—one made with Indian ink, I believe, and two more having the faint red tint that is spoken of. These I graduated myself by means of chloride of silver paper, by collodio-bromo-iodide emulsion, and also by gelatine emulsion plates, and all gave the same scale of tint within the limits of error of observation. I therefore take it that there cannot be much amiss with my observations made by this method. The same results which I obtained with the sensitometer were also obtained by contact printing in the camera, as described (I think) by Mr. Blanchard. The standard negative employed is one developed on a collodion emulsion plate with ferrous oxalate, and the image is intensely black. In a series of experiments which I undertook some little time back, I found that the sensitometer was equally trustworthy as the method adopted by Dr. Vogel. If direct camera testing is to be resorted to, I can recommend the plan adopted by Mr. England, of using twin lenses, and exposing with different diaphragms, or by giving different time exposures.

I am very sorry to differ from such a *savant* as Dr. Vogel in this matter; but as he has apparently taken up the views of the writer of "In and Out of the Studio," who wrote a few months ago challenging the statement I made regarding the sensitiveness of certain plates, I have felt bound to give my version of the matter in self-defence. Had I left it where it was, it might have been imagined that I had something to retract, which I certainly have not.

I had nearly forgotten to answer in a direct manner Dr. Vogel's question which he puts to me as to whether I have "taken into consideration the colour of my sensitometer screen." I may say that I have fully done so, as he will see from my preceding remarks. I also asked a question in my last communication, to which, however, I have no reply, which was as to whether he had practically tried the difference between gaslight and daylight for testing plates.

There is evidently something beyond the mere colour of the gaslight and daylight which makes the difference in measurement between us, and not till this cause has been discovered can the discrepancy be explained. Perhaps a correspondence not carried on through the medium of a public journal may enlighten both of us.—Yours faithfully,

W. DE W. ABNEY.

Proceedings of Societies.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

AN adjourned meeting was held in Lamb's Hotel, Dundee, on Monday evening, March 14th, Mr. J. C. Cox in the chair.

Messrs. W. J. Anckhorn and H. V. Plenderharth were elected members of the Association.

The SECRETARY having read several communications, which were referred to the next council meeting, the nomination of office-bearers for the ensuing year was proceeded with. Mr. James C. Cox was unanimously invited to again accept the office of President, it being felt that the progress of the Association was due to his zeal and liberality. Nominations for the other offices were duly made and seconded, the elections taking place on the 7th prox.

Mr. G. T. ROGER exhibited some excellent prints from negatives taken at the electric light meeting.

Mr. J. ROBERTSON introduced a double dark slide for dry plates, which he had had made as an improvement on that of Mr. Baynham Jones for lightness and portability; after examination and discussion, a vote of thanks was passed to the exhibitor.

A vote of thanks to the Chairman brought the proceedings to a close.

A SECOND special meeting of the Association, on the invitation of the President, was held in the Camperdown Linen Works, Lochee, for another series of experiments with the electric light, on Wednesday evening, March 16th. Mr. Cox welcomed a number of members and friends at seven o'clock. The lights on this occasion were divided, each with a power of about 1,500 candles, and separate sets of screens provided to each, so that two exposures could be made simultaneously, the light being filtered through screens of blue gauze. The dark-room and developing arrangements were very complete, and the whole testified to the care and forethought of Mr. Cox. A number of cameras were set to work, and negatives obtained more or less successful; but as several were not developed on the spot, the results will not be known until next meeting.

The PRESIDENT exposed several frames to the light for platinotype, from which he developed some beautiful prints after about one and a half hour's exposure; those from instantaneous negatives of marine subjects were much admired.

The members were then invited to inspect a new rolling press which Mr. Cox had just completed, and which was being driven by steam power in another portion of the building; it was found capable of rolling prints 18 by 15, and was novel in construction, being continuous in movement, and by a check action could be made to roll a print of any length, avoiding to a nicety the lettering on the mount. It is to be hoped that Mr. Cox may be induced to publish full descriptions and drawings of this valuable addition to photographic appliances.

A most agreeable and profitable evening was brought to a close by a sincere vote of thanks to Mr. Cox for his generous exertions to promote the interests of the Association, and of the art generally.

Talk in the Studio.

THE *Athenæum* says :—"Mr. Henry Fox Talbot was essentially the originator of the first photographic process of any value in this country, and of the first process on paper which possessed any high degree of sensibility. It is pleasant to have a portrait of such a man. Up to the present time we have not possessed one. The *Photographic News* of March 11th has issued a photo-engraving, executed by M. Dujardin, of Paris, enlarged from a photograph by Mr. Moffatt, of Edinburgh, which is a fine example of photo-engraving, and a life-like portrait."

To Correspondents.

BURBIDGES.—There is but little to choose between the lenses you name; and with either you will, we are convinced, be thoroughly satisfied.

A GREATLY-BOTHERED AMATEUR.—1. Dilute the bath with twice its volume of water, and carefully filter. Its original strength may now be restored by evaporating it to its original volume, or by adding the requisite quantity of silver nitrate. 2. There can be no doubt that some kind of organic matter is present. To remove this, make the bath slightly alkaline with common washing soda, and expose to light for some days; after which a feeble acid reaction must be established by the addition of nitric acid. It also appears to us that you are using an over-iodised collodion: add one-fifth or one-fourth of plain collodion.

BLUE MARK.—We are inclined to attribute the appearance to one out of three causes:—1, An inequality in the texture of the paper; 2, Contact with the fingers during toning, whereby some parts of the paper may have become sodden, and more readily acted on by the solution; 3, Insufficient agitation after the addition of fresh gold solution.

N. T. GATES.—We believe that what you enquire for is likely to be in the market soon. 2. Yes, but more time would have to be expended in adjustments. 3. In every respect as good. 4. Undoubtedly, the demand for work of this class being very large. Let us hear from you when you have commenced working.

IGNORAMUS.—Provided the light is not very intense, the operations of washing, toning, and fixing may be performed in daylight.

A BEGINNER.—1. The partial opacity of the air, and other circumstances, interfere with what would otherwise be the exact ratio. For objects which are tolerably near, and when the air is free from what one may call actinic fog (not necessarily accompanied by visible cloudiness), the exposures may be inversely as the square of the distance of the object. 2. If the back focus were the same for objects at all distances, it would be as you suppose. 3. By no means, although an experienced photographer will learn much by an inspection of the image; but he must take into account colour as well as intensity; and, moreover, there are other circumstances which occasionally influence the actinic power of the light without perceptibly altering its colour. 4. The price of Heighway's "Handbook of Photographic Terms" is 2s. 6d.

S. H. G.—1. It is sold by Messrs. Ihlee and Horne, 31, Aldermanbury. 2. We cannot tell you the price.

A LITTLE PHOTO.—A leader on the subject will appear in an early issue.

W. FIELD.—You will find full particulars for the production of this class of work in the present number of the NEWS.

CHARLES JONES.—Thanks for your letter, but we fear that it comes so long after the query as to be almost too late.

GREENHAND.—1. From one-fiftieth to one-tenth of a second. 2. In the case of high buildings taken at close quarters, it serves to correct distortion arising from an inclination of the camera. 2. Extra sharp at the edges of the field, and, moreover, objects at different distances, are brought more perfectly into focus.

C. E. G.—Try Solomon, 22, Red Lion Square.

GEO. MANLEY.—The address of the gentleman referred to is Royal Arsenal, Woolwich; but more information could be obtained from the State Printing Office at Vienna.

W. G. L.—1. Although the producer of a composition has a copyright in it as a composition, he cannot sell this if it contain pictures which are the property of another. 2. We fear that the fact of Mr. —— having borrowed your apparatus and materials will give you no claim to the productions.

OTTO PFINNIGER.—Answer sent by post.

THE REV. B. T. THOMPSON.—After fixing and a few minutes' washing, put the plate into a saturated solution of alum, and allow it to remain for half-an-hour or more. Do not mix the alum and hyposulphite together. Wash thoroughly after the alum bath.

W. S. WHYLOCH.—We reply in brief to your query thus:—If anyone is paid by you (in money or kind) to execute certain work for you, you have, of course, undoubted right to that work in every shape and form.

DRY PLATE.—Capt. Abney's "Practical Working of the Gelatine Emulsion Process" is a supplement to his "Emulsion Processes in Photography," the first-named being published at 1s. 6d., and the latter at 2s. 6d.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1178.—*April* 1, 1881.

CONTENTS.

	PAGE
Fixing Gelatine Negatives	145
Weighing and Measuring	146
Photography for the Anthropologist	146
The Composition of Pyroxylin	147
Photography In and Out of the Studio	147
At Home—A City Phototype Establishment	148
Notes	149
Topics of the Day—Photography and Art. By Lyddell Sawyer	151
French Correspondence. By Leon Vidal	152
Odd Jobs. By the Author of "Looking Back"	153
Action of Light upon the Soluble Iodides	154
The Melbourne Exhibition	155
Correspondence	155
Proceedings of Societies	156
Talk in the Studio	156
To Correspondents	156

1.4.81

FIXING GELATINE NEGATIVES.

Some remarks have recently been made with reference to the inconvenience of keeping the hyposulphite bath in the dark room; and it has also been stated that it is not necessary to fix gelatine negatives before exposure to light. But, although in many cases it may be found that no harm has resulted from fixing in open daylight, it is obviously a dangerous practice, and one which will frequently lead to the production of a thin veil over the shadows. This veil may be, and usually is, so thin, that it is scarcely perceptible to the eye on looking through the negative; but the influence on its printing qualities will, nevertheless, be easily perceived in all cases where strong daylight has been allowed to fall upon the negative previous to fixing.

As a proof that the action of the developer does not destroy the sensitiveness of the unaltered bromide of silver, we need only state the fact that a gelatine dry plate may be immersed, before exposure, for a considerable time in the developing solution, and, after washing and drying, will be found to give as good a picture on exposure as the original plate would have done. Again, it will be found that if the developed negative is placed, before fixing, in strong sunlight, the unaltered bromide of silver rapidly darkens in colour, so that a positive might be printed upon its under surface. If such a darkened negative be now immersed in the fixing solution, the fixing *apparently* proceeds as usual, and an ordinary examination of the film might easily fail to detect any veil over the shadows. A more careful scrutiny, however, will, without doubt, show that an excessively fine deposit of metallic silver has formed upon the shadows. If the eye fail to detect it, the microscope will readily reveal its presence.

The cause for this is not hard to understand. It is well known that in the presence of daylight, bromide of silver rapidly becomes converted into sub-bromide. So rapidly, indeed, is the change effected, that a momentary exposure of the pure bromide is sufficient to cause a perceptible change of colour. This sub-bromide, however, is partially dissolved by hyposulphite of soda, and this explains why the negative appears to fix as well in daylight as in the dark room. But the action of hyposulphite upon the sub-bromide is to dissolve only part of the salt as hyposulphite of silver, reducing the remainder to the metallic state, thus:—

$$2Ag_2Br + Na_2S_2O_3 = Ag_2 + 2NaBr + Ag_2S_2O_3$$

and it is this reduction of part of the silver salt to the metallic state which causes the veil over the shadows.

It is thus seen that the hyposulphite bath acts the part of a developer upon altered bromide of silver, with this difference, that the metallic image, remaining after immersion in the hyposulphite, is less visible than is the image formed by the dark-coloured sub-bromide itself.

Now if, as can be proved to be the case, the developed negative is still susceptible to a change of this kind, it can scarcely be considered a safe process to fix in the full light of day.

There are, however, several points which must be remembered, and which may serve to explain the diversity of opinion which may exist upon this subject. In the first place, even after the prolonged action of strong sun-light, the veil resulting from the reducing action of the hyposulphite upon the sub-bromide of silver may be, and generally is, so slight as to be almost invisible except in its influence upon the printing qualities of the negative. Then, again, if the exposure be of very short duration, the alteration will be so small that it may be quite over-looked. Lastly, the influence of subdued light in producing alteration of the film to the state of sub-bromide appears to be very small indeed, so that a gelatino-bromide dry plate might, perhaps, be allowed to remain for three weeks in a dimly-illuminated corner without betraying any evidence of darkening in colour.

Yet it must be remembered that this darkening of the film is only an extended action resembling what takes place in the ordinary exposure of a plate in the camera, and it cannot be doubted but that the moment an unfixed negative is exposed to actinic light some molecules of silver bromide are reduced to the state of sub-bromide, and as certainly as this occurs, so will traces of metallic silver be left on the shadows after fixing.

Immunity from any serious injury to the negative can only be the result of accidental circumstances, and not of any want of sensitiveness in the silver bromide itself; and it is evident that, by even a small amount of forgetfulness, the habit of fixing in daylight may become highly injurious to the production of the best results.

We do not think the inconvenience of having the hyposulphite bath in the dark-room is so great as may be imagined, except in cases where want of sufficient space renders it advisable to diminish as much as possible the number of dishes kept in use.

With reference to the employment of the alum solution, we think it is of importance that the negative should be immersed in the alum bath before fixing, for the clearing action of the alum appears to be far more effectual before the hyposulphite has acted upon the film. A second alum bath might be used with advantage after fixing and washing, to eliminate the last traces of hyposulphite. Another reason for the use of alum before fixing is to be found in the risk of frilling when washing before the application of the alum, and if the alum be used before washing, one of its great advantages is destroyed, viz., its power of eliminating minute traces of hyposulphite of soda.

If to the second alum bath a little hydrochloric acid is added, not only is the decomposition of any traces of hyposulphite hastened, but the negative is much more effectually cleared from any discolouration from the developer; while, at the same time, there is not the same danger of frilling which is so serious an obstacle to the use of hydrochloric acid by itself.

In cases where gelatine plates are used in a wet condition, it will be found that a far longer time is required for fixing and washing, on account of the film containing already a great deal of water, and in this case the danger of fixing in full daylight would be greatly increased.

WEIGHING AND MEASURING.

In the majority of cases it is quite unnecessary for the photographer or the photographic chemist either to weigh or measure with that extreme accuracy which is required in purely physical and chemical investigations, although sometimes considerable advantage may result to the photographer from the careful and intelligent use of finely-adjusted weighing or measuring apparatus. As bearing directly on this subject, we may remind our readers that there is no advantage whatever in weighing out a substance with extreme accuracy unless corresponding precautions are taken to ensure its purity and constancy of composition, for in photography, as in theology, there is a possibility of straining out a gnat and swallowing a camel. Suppose that we require 100 grains of ammonium bromide, and the salt is weighed just as received from the dealer, the chances are that we shall have about 97 grains of actual bromide, and perhaps 3 grains of water, as the factors of our 100 grains. Under these circumstances it is obvious that the use of a more accurate balance than ordinary small scales, turning with about a third of a grain, is altogether out of place and useless. Few commercial salts are so free from hygroscopic moisture as to be constant within one per cent. of their weight; and unless precautions to remove this water are taken, there is no occasion to spend ten or twentyfold time in weighing accurately by means of a chemical balance. In short, it may be stated that, taking the ordinary run of photographic work, more inaccuracy arises from want of constancy in the materials themselves than from a lack of sensitiveness on the part of the scales employed, or inaccurate adjustment of the weights. Nor, indeed, should we blame the manufacturers of chemicals on this account, as by far the greater part of the salts which are sold in the solid state absorb moisture with readiness, and hold it with considerable tenacity. In many instances the most convenient method of drying a saline substance for weighing consists in subjecting it for some hours to the temperature of boiling water—a double jacketed copper water oven serving for the purpose—the water being retained in a state of ebullition by means of a Bunsen burner. There are, nevertheless, many solids which refuse to give up the whole of their water at the temperature in question, and there are others which are decomposed at this temperature; so that in those cases a higher temperature must be employed, and in these a lower. When a body cannot be heated without decomposition it is usual to dry it by placing it under a bell jar side by side with a dish containing calcium chloride, or some other hygroscopic body, and the rapidity with which the moisture is removed is much increased by the creation of a partial vacuum in the bell jar. It occasionally happens that when a crystallized salt is dried under certain and definite conditions, as specified above, a certain proportion only of the water is driven off, leaving a residue of determinate composition. Of course, information as to the behaviour of individual substances must be sought in the manuals of chemistry, but we propose to shortly tabulate particulars regarding the precautions requisite for obtaining, in a state of constancy, those of most general use by the photographer.

The measurement of liquids is generally a much less accurate process than the operation of weighing, and the ordinary conical measure used by druggists is about as ill adapted for exact measurement as any arrangement which could be devised, for a little variation in the height of the column corresponds to a very considerable difference of volume.

Ordinary measures are so graduated that the lower part of the curved surface of the liquid should correspond to the engraved line, although it occasionally happens that each graduation is represented by two lines about a fortieth of an inch apart, the upper line being intended to correspond with the edges of the cup-like hollow formed by the surface of the liquid, and the lower line with the bottom of the depression.

A much more satisfactory measuring arrangement than the ordinary open measure consists of a flask or bottle having a single mark on the neck, but in this case a separate measure is requisite for each quantity. Measuring flasks of this kind can be obtained from dealers in chemical apparatus, and a set of these should have a place in every photographic laboratory. When one wishes to make a still further advance as regards accuracy of measurement, the best plan is to use pipettes, constructed to deliver definite quantities. The ordinary pipette consists of a glass bulb, which is blown near the middle of a tube, the lower end of this tube being then drawn out to a point. The pointed extremity being introduced into the liquid, suction is applied to the upper part of the tube, and continued until the liquid has risen a little above the mark on the stem. The top of the tube is then closed with the forefinger, when the pipette can be lifted up without any of the liquid escaping. A slight relaxation of pressure on the top of the tube allows a little air to enter, and a corresponding amount of the liquid flows out through the point. When the engraved mark on the stem is reached, the flow is stopped by perfectly closing the top, and the pipette is transferred to the vessel intended to receive the measured quantity of liquid, after which the finger is removed. Pipettes are usually graduated so as to allow for the liquid which remains adherent to the interior, and also for the last drop which remains in the point of the instrument; although sometimes the latter is intended be blown from the instrument by an application of the mouth to the upper extremity.

PHOTOGRAPHY FOR THE ANTHROPOLOGIST.

Modern discoveries in photography have greatly widened the sphere of its usefulness. This is—or ought to be—more especially the case in its application to science. We say "ought to be," as its power of delineating accurately objects placed in focus, and within the field of the camera, has not yet been fully recognized by scientific men. The certainty, simplicity, and rapidity of gelatine dry plates render them available as a means of illustrating an ever-widening range of subjects. If we take, for example, the subject of anthropology, which has given rise to endless discussions and theories since the time when Blumenbach first attempted to classify human skulls, had photography been skilfully applied as a means of recording the form and dimensions of human crania, a new power would have been placed in the hands of anthropologists. The entire contents of Blumenbach's museum could have been carried in a portfolio, and circulated broadcast over the world. Not only could absolutely perfect mimicry of outline be obtained, but a trustworthy scale and system of measurement might have been established.

In order to show how this may be done, let us suppose we wish to ascertain the transverse or longitudinal dimensions of a skull, as well as to register its general outline.

It is necessary to have standard scales of measurement, black on a white ground. If the skull is bisected, the scales may be photographed with it in position. If the skull is entire, two exposures will be required for one plate. The objects to be photographed must be taken against a black background. First, the engraved scales must be placed in focus, and photographed on the plate. The scales must then be removed, and the skull substituted for the scales. This has to be done without disturbing the camera, and the skull so placed that the scale should form an exact line of central bisection.

The second exposure is now given to the plate, and the skull photographed. The resulting negative will thus present a photograph of the form and outline of the skull intersected by a visionary scale by means of which its dimensions are registered. From this central scale, measurements may be made in all directions. Dolichocephalic and brachycephalic skulls may be thus classed at will.

The same plan may be adopted in photographing types of race, profile and full front, with a visionary scale falling through the centre of the object to be photographed.

If a system such as this were employed, it would prove extremely useful, since it would afford facilities for comparison, and at the same time supply satisfactory data for the anthropologist.

We propose on a future occasion to specify more particularly how all this may be most simply carried out, and to suggest further applications of photography to various branches of science.

THE COMPOSITION OF PYROXYLIN.

From the investigations of Dr. J. M. Eder (Transactions of the German Chemical Society, 1880, p. 169) it would seem that pyroxylin is not a nitrogen compound, but a nitric acid derivative of cellulose after the general formula, $C_{12}H_{20}—nO_{10}—n(O.NO_2)n$. Cellulose hexa-nitrate, $C_{12}H_{14}O_4(NO_3)_6$, or gun-cotton proper, is prepared by plunging cotton-wool, dried at 100°C., into a mixture of 3 vol. sulphuric acid of 1·845 sp. gr. and 1 vol. nitric acid of 1·5 sp. gr., the mixture having been first cooled to a temperature of 10°C. At the end of twenty-four hours the cotton is taken out, pressed, and thrown into plenty of water; it is then rapidly washed, allowed to stand for several days in a large quantity of water, and finally washed a second time in hot water. From 100 parts of cotton we should get from 175 to 180 parts of pyroxylin. Of this gun-cotton, from 1·2 to 5·8 per cent. is soluble in ether-alcohol. Pure cellulose hexa-nitrate has the structure of cotton, and may be distinguished from other pyroxylins (collodion pyroxylins) by its inflammability and explosiveness (although it does not readily detonate by percussion); also by its insolubility in ether, in absolute alcohol, in ether-alcohol, in glacial acetic acid, and in methyl-alcohol. Acetic ether, either hot or cold, is incapable of dissolving the hexa-nitrate, even with the addition of some ether; at the most, the fibre will swell a little, but will not lose its structure. On the other hand, in acetone, it swells up rapidly, and forms a transparent jelly, which, when the acetone is in excess, gradually dissolves. The firing point is between 160° and 170° C. With potassium nitrate and sulphuric acid the hexa-nitrate is not formed.

Cellulose penta-nitrate $C_{12}H_{15}O_5,(NO_3)_5$, is formed by treating cotton at a low temperature with mixtures of highly concentrated acids, in the presence of much sulphuric acid mixed with other nitrates; it may be obtained in a pure state by dissolving pyroxylin in hot nitric acid, and precipitating with an excess of sulphuric acid. It is soluble in ether-alcohol, and acetic ether, but insoluble in pure ether and in alcohol. Cellulose tetra-nitrate, $C_{12}H_{16}O_6(NO_3)_4$, and cellulose tri-nitrate, $C_{12}H_{17}O_7(NO_3)_3$, are formed in conjunction in the preparation of collodion cotton, but have not yet been completely separated. The collodion cotton of Scherer consists principally of tetra-nitrate; this substance is insoluble in pure ether and in alcohol, but dissolves readily in ether-alcohol, in acetic ether, in wood spirit, in a mixture of acetic acid and alcohol, or in acetic acid and ether. It is scarcely soluble in glacial acetic acid in the cold, but dissolves slowly in the same reagent when boiling. The tri-nitrate is gradually dissolved by absolute alcohol at ordinary temperatures, and when the solution is treated with a considerable excess of ether, the concentrated solution in ether alcohol precipitates in a milky state. It is readily soluble in acetic ether, in wood spirit, and in boiling glacial acetic acid. By treating both tetra-nitrate and tri-nate with a mixture of concentrated sulphuric and nitric acids, they are converted into the penta-nitrate and the hexa-nitrate; solutions of potash and of caustic ammonia convert them into the di-nitrate. Cellulose di-nitrate, $C_{12}H_{18}O_8(NO_3)_2$, is always formed as the end-product, when potash or ammonia are used to remove the nitric acid from the other cellulose nitrates; it can also be obtained by acting on cellulose with a very dilute and hot mixture of sulphuric and nitric acids, at the time when the pyroxylin begins to dissolve with partial decomposition and the development of red fumes. A solution of the di-nitrate in ether-alcohol gives a milky and cloudy layer of collodion. The mono-nitrate of cellulose has not yet been obtained.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographers and Artists—Photographic Forgers—A New Photographic Toy.

Photographers and Artists.—The difference between the photographer and the artist was unintentionally shown at a recent meeting of the Royal Astronomical Society, furnishing a significant corollary to the discussion at the Photographic Society held but a few days previously. The incident arose out of a note read by Mr. Knobel on the comparative brightness of various parts of the nebula of Orion, wherein he stated that the brightest part as shown in Dr. Draper's photograph did really correspond with drawings made by other observers—a point which had been disputed. Furthermore, Mr. Knobel had himself made a series of measures with an astrometer, and his measurements had accorded with Dr. Draper's photograph. This statement brought up Mr. Brett, R.A., who said that he did not see any use in such measures as those. What was wanted was a picture drawn by a reliable artist. If anyone wished to draw the face of a little girl, they would not think of measuring the height of one eye above the ground, and then the height of the other, but they would proceed at once to draw the face, as well as they could. If this argument signifies anything, it implies that an artist should never take the trouble to be scientifically accurate, but "do as well as he could" without measurements. This really is what artists have been doing for ages, and photography has had to convict them of innumerable errors. The eye is not naturally an unerring discriminator of what is true and false, and after it has become accustomed to certain conventionalities it readily agrees to take them as representations of nature. No doubt, to the Chinese critic, a portrait perfectly devoid of shadow is the very *beau ideal* of accuracy; but the self-deception is not a whit more glaring than in the simpering inanities which used to be perpetrated by artists for the "Books of Beauties" and the "keep-sakes" of our grandfathers. What Ruskin did for the landscape painters years ago is now being done for the portraitists by photography, and the sooner this fact is acknowledged the better will it be for art.

Photographic Forgers.—It would be a nice point in casuistry to decide whether a photographer who is employed to copy an old print and produce a *fac simile*, is guilty of any moral wrong. When a commission of this kind is given him, is he bound to put the question, "Are these *fac similes* you want me to execute to be sold as originals?" No doubt if the thing to be copied is a bank note, he would naturally surmise that forgery was intended, and, as in this case, it would be a punishable offence, he would not be very eager to undertake the task. But in the case of a rare print, can he be held to have transgressed any article of the moral code when he assists unknowingly in the perpetration of a forgery? If he can, what is to be said of the frank admission of an Italian photographer, who is thus spoken of by a correspondent of a daily paper:—"Last week I saw one of the most skilful photographers in Rome, who is well known to be specially expert in employing the most recently-perfected processes of heliogravure; he informed me that he had recently been supplied with old paper selected for the purpose of forging examples of various prints and engravings of great value." Professional forgers have long done a thriving trade in the production of "genuine" pictures of old masters, and in the manufacture of furniture and china; it is not very comforting to know that photographers must be added to the list.

A New Photographic Toy.—Mr. Jabez Francis, of Rochford, Essex, has invented a new photographic toy, which he calls a photo-chromoscope. It is thus described. At one end of a box 22 inches long and 8 inches square is fixed a lens 5½ in. diameter and 10 in. or 12 in. focus. At the side of the box, ten inches from the lens, there is a slit large enough to admit a carrier, in which is placed an uncoloured lantern transparency. About one inch behind the slit is a sheet of ground glass, which can either rest in grooves, or may be fastened by pieces of wood glued on to the sides of the box. In the space between the ground glass and the other end of the box (where also a second piece of ground glass is placed) is fixed a drum of an octagon shape. This drum is made by cutting two pieces of mahogany ½ inch thick to the octagonal shape required; these mahogany ends are to be fixed on a ¼ inch iron rod 6½ inches apart; which rod should be 9 inches long to allow one end to project through a hole in the side of the box, and on this projecting piece a knob may be fixed to turn the drum. The instrument is completed by fixing to the wooden ends pieces of various coloured glass or gelatine, which thus form the sides of the drum. To use the photo-chromoscope, all that is necessary is to put a transparency in the carrier, turn the ground glass end of the box to the light, and look through the lens, and the picture, to use the words of the inventor, "will be found to be illuminated with beauteous tints." Mr. Francis, like all inventors, is enthusiastic over his creation, and he tells us that "a landscape may appear lighted-up with sunshine in the foreground, the valleys enriched with green, a soft, purple haze on the distant mountains, while an azure tint o'erspreads the horizon. A slight turn of a thumb-screw at side, and the whole scene changes as if by magic; moonlight effects are produced, changing again to early morning; the light creeps on, and ere long a succession of tints of lovely hue astonish and charm the beholder—no paint, no daub, to partially obliterate the picture, the details of which are preserved in all their purity, and their beauty is enhanced a hundredfold." Allowance must, of course, be made for the pride of the designer; but there is no doubt that the photo-chromoscope is a very pretty toy, and would serve for a sitter to while away half-an-hour in the reception room very pleasantly. It has also the merit of being very easily constructed: but the moderate price at which it is manufactured makes it questionable whether our readers will not prefer to purchase the article. Mr. Francis recommends the arrangement of the tints thus:—Pale blue, light rose, gold, green, red, mauve, rose, blue, yellow, gold.

At Home.

A CITY PHOTOTYPE ESTABLISHMENT.

Our visit has to be made at twice, for the photographic operations connected with the preparation of phototype blocks cannot be undertaken in the city. But first a few words by way of preface. The word phototype is so universally applied to all sorts of photo-mechanical printing, that it has almost ceased to have any definite meaning, and therefore the process we are about to describe requires a little explanation. It is the production of typographical blocks, blocks that can be worked in the ordinary printpress along with type, we refer to, and which, as we shall presently show, are produced by a combination of three arts—viz., photography, lithography, and etching. The production of these printing-blocks has of late become a busy trade, particularly in Paris, London, and New York. We mention Paris first, because it seems to have been the cradle of the art, and the employés in London are, for the most part, Frenchmen. We can get plenty of good photographers and lithographers in this country, it appears; but those who understand etching are few and far between. If you can call to your assistance a skilled photographer, a skilled lithographer, and a skilled etcher, then there is little difficulty in the production of typographical blocks by the aid of photography; but it is only in the presence of these three that success can be hoped for. The difficulties in the way of producing good work are so many that it requires the most practised in each craft to contend with them; and let a man be ever so ready in understanding the three processes involved, if he has not served an apprenticeship to them all—and this is very unlikely—he will not succeed unaided.

The *raison d'être* of these phototype establishments is not far to seek. Our cheap illustrated newspapers cannot pay for wood blocks—at any rate, for all their pictures, and a less expensive substitute is imperative. Photography stands ready to lend a hand in the dilemma. Any picture that appears in the foreign illustrated journals of sufficient interest is made to do duty again over here. The picture is sent to a city phototype establishment, and in a couple of days a suitable printing-block is returned. It does not matter what the size of the original picture may be, or what is the size of the block desired; the camera is ready to bring about any modifications of this kind that may be requisite, and the work is done—thanks to considerable competition—at a very low rate; the charge is but 3½d. to 5d. per square inch, so that a zinc printing-block, measuring four inches each way, is produced for less than eight shillings.

The "studio" we visit (if an open, glass-roofed shed can be dignified by the name) is the most simple of its kind within our knowledge. The photographic arrangements, too, are of a most primitive description. There is a solid square table in the middle of the apartment, measuring about four feet, and the camera, with a long base-board, is pivoted on it. The base-board, if it may be so termed, is continued in front of the camera, and ends in an upright, against which the picture to be copied is placed. It is rare that any large work has to be copied, and rare, too, that the picture has to be reproduced the same size as the original. The camera is, indeed, somewhat small for the purpose, capable of taking nothing larger than a twelve-inch plate. "But we never have an order for any very big work of this kind," says our informant.

The camera and base-board is so loosely pivoted, that it can not only be revolved with the greatest ease to suit the lighting, but either end—camera end, or the end at which the upright and picture are—may be heightened or lowered, which is done simply by wedging a block of wood underneath, much as if it were a see-saw. A rectilinear lens, of twenty-six inches equivalent focus, is employed for the work, and the negatives present no point of difference from ordinary photo-lithographic plates. Transparent lines upon an opaque ground is, of course, the result aimed at, and this is produced by the ordinary bichloride of mercury intensifier, although, to our thinking, the Eder and Toth lead intensifier, in use at the Woolwich Photo-lithographic Establishment, gives greater opacity, and is more simple to use.*

Before quitting this part of the establishment, we called attention to the "balance" arrangement for copying-cameras, in use in America, and of which a sketch appears in our last Year-Book. This arrangement would be found particularly useful for phototype work: and we may mention, by the way, that the cut in question was reproduced from the *Scientific American* by the phototype process we are now describing.

---

* See Photographic News, March 19th, 1880.

The lithographic and etching operations are carried on in a dark little court in the vicinity of Fleet Street, and thither we journey in company with some prints upon bichromated gelatine paper from the negatives we have seen taken. The "studio," we have said, was rough and crude enough, and the workshops here are in keeping with it. The place is littered with old frames and dirty machinery; but there is plenty of work going on, nevertheless. This first division of the shop is confined to lithography; at the further end the etching process is gone through.

One of our prints is faced with ink, much in the same way as already described in the News of the 19th March, 1880. The lines of the drawing, which previously were of a dark brown upon the yellowish bichromate paper, appear, now the superfluous ink has been removed, of a jet black, the viscid ink standing up in ridges. In the photo-zincographic process, as it is carried on at Southampton and elsewhere, this impression in fatty ink, or transfer, would be laid upon the zinc plate, and the latter then etched in acid. But it is different in producing a typographical block, and this is a point to which we want to direct our readers. The inked photograph is first put upon stone before it is transferred to the metal. This is an important point, and this is where the skill of the lithographer is made use of. He can produce a much better result on a lithographic stone than on a zinc plate. The former surface is so even and smooth, and, moreover, is so well in hand in the press, that if the photo-lithograph is at first deficient in some respects, it is soon improved under the hands of the lithographer. We see our print now on the stone, to which it has been transferred by pressure, and the lithographer, by all the little means at his disposal—inking-rag, acid-sponge, scraper, roller, and camel-hair pencil—coaxes and amends the image to such a degree that we hardly know it again. One sees at once why a skilful lithographer, and not one who has a passing acquaintance only with the process, is necessary.

The black-lined image on stone, now well rolled up with the ink roller, and with no trace of that rottenness in the lines which was here and there visible when the picture was originally transferred, is now ready for re-transfer to zinc. If the first re-transfer is not successful, another may be taken, and so on, once the image is on the stone; so the intermediate process, besides its utility, acts as a sort of insurance against failure. An impression is taken on a suitable piece of transfer paper, and the latter is then pressed into contact with a well-cleaned zinc surface. The image in fatty ink now rests upon the zinc plate, and this is ready for etching.

The etching process in all takes about eight hours. A big shallow tray or bath is filled with water acidified with nitric acid. We dip a finger into the liquid; to the taste it is acid, but not unpleasantly so. This is the first bath, and a weak one. As the etching goes on a stronger solution is employed. During the immersion of the zinc plate the bath is kept continually rocked by a lad who sits beside it. Ten minutes or a quarter of an hour passes, and then the plate is lifted out. It is taken to a side-table and then rolled up with an ink roller as if it were a lithographic stone; thence it goes upon a heated slab, which quickly dries the plate, and in this condition some finely-powdered resin is sifted over it; after this the plate once more goes into the etching bath. This treatment is repeated at frequent intervals, the image being rolled up every time it comes from the bath, and powdered resin being sifted over, sometimes when the plate is wet, sometimes after it has been dried and warmed, according as the etcher sees fit. The ink and the resin preserve that part of the zinc which they cover from the action of the acid, and as the process proceeds, and the layer of ink gets thick, the etching may go on with increased rapidity. But until the fine lines are safely etched, it is necessary to proceed with caution. The heating of the zinc plate is for the purpose of melting the resin so that it may run down and protect the walls or ridges upon which the fine raised lines stand, and prevent any under-mining by acid. Towards the end of the process, as we have said, a much stronger solution of nitric acid is employed, and the eating away of the metal goes on apace. In the end the image appears raised from the surface of the plate to the extent of a twentieth of an inch, and the finished printing-block is before us.

The etching process appears simple enough to the eye; but as in the lithographic work, and in the photography, for that matter, a skilful hand and ready wit are constantly necessary to guide the result towards success. Phototyping may be considered as yet in its infancy, and in the future must prove an extensive field of employment for photographers. For this reason the taking of photo-lithographic or black and white negatives is a branch of the art that young photographers will do well to cultivate.

The "By-the-Bye" next week will be "Vanity Fair:" the following "At Home" will be "Mr. H. Wilmer at the Great Eastern Railway."

Notes.

Professor Adams has just finished a course of lantern lectures on the electric light, the last lecture of the series having been delivered last Monday evening. On this occasion the various incandescent lamps were exhibited and described, the lecturer entering into an elaborate explanation of Ohm's law as bearing on the working of these lamps by dynamo machines or batteries. The system which appeared to give the most satisfaction to a numerous audience was that recently introduced by Mr. Swan. Twenty Swan's lamps, arranged in five ground glass globes, served to brilliantly illuminate the large hall of the Society of Arts, the light being perfectly steady and soft, though brilliant.

"To the list of august photographers may be added the name of Prince Milan, of Servia," writes a correspondent from Germany.

The position at Majuba Hill, where General Colley made his last stand against the Boers, and met with his death, is to be photographed. One of these days, it will be but a matter of course for a general to supplement his reports with photographs from the scene of action. Engineers conducting large works have for some time past employed photography to illustrate their "progress reports," and our generals, when they do make progress, will ere long be expected to do the same.

It is generally accepted that iodide of silver is more sensitive to the violet end of the spectrum, and bromide of silver to the red; yet Dr. Huggins, who has for some time past occupied himself in depicting the spectra of the stars, and in examining by photography only the blue, violet, and ultra-violet rays, employs, strange to say, bromide of silver plates.

It is satisfactory to learn that the concert recently given under the auspices of the Photographic Club resulted in a profit of £11 17s. 3d., which has been handed over to the Photographers' Benevolent Association.

One of the best illustrations of what may be done by the phototype process, described in "At Home" in another column, is the so-called "Graphic Programme," well known in connection with London and provincial theatres. The fine outline sketches on these programmes of characters connected with the play are drawn, in the first instance, some two feet high, and then reduced by photography to the size we see them. A reduction, as a matter of course, ensues in the thickness of the lines, and the result is the beautifully fine drawings, which are practically unobtainable in any other manner.

The other day we applied for a few screws at a shop just opposite Farringdon Street station, where trays of screws, nails, and small tools crowd the window. The proprietor stood like a spider in the centre of his web, and quietly reached what was required with a magnet. The idea is worth note. It reminds you of the extraction of a speck of iron from the interior of the eye by means of a soft iron probe powerfully magnetised by an electric current, an operation that surgeons practise.

Mr. George Bradforde, the author of "Looking Back," will contribute an occasional article on "Odd Jobs." The first appears in our columns to-day.

There comes a complaint from photographers in the provinces, which may, too, be rife in town, for aught we know, respecting the exhibition of specimens. We heard it first in Manchester, it was repeated in Bristol, and now it comes to us from Brighton; and since it emanates from studios of the highest class, we feel it our duty to call serious attention to the circumstance. It is connected with the subject of "professional beauties." Materfamilias has got it into her head that if her daughters are photographed, their portraits will be hawked about in the shops and bazaars. The result is a two-fold injury; either she will not let her daughters be photographed at all, or, if she does, and they happen to possess pretty faces or graceful figures, then she prohibits the photographer from letting his patrons see the pictures.

"I cannot show you some of our best results," complained a gentleman the other day. "I had to promise to print no more copies than were required for the order, before my customers would consent to sit. Everybody thinks we mean to publish their portraits." No doubt in town less restrictions are made, for there is not that same fear which Mrs. Blushington, of Stoke-cum-Pogis, entertains, that her daughters will be "on sale" at the bookseller's and circulating library in the High Street. To many, perhaps, the whole subject may appear a little frivolous; but, we repeat, a solemn assurance has been given us by several photographers of high standing that the disposition to publish "fashionable beauties" has seriously interfered with their business. Can anyone suggest a remedy?

Mr. Harvey Barton selects square-faced bottles for his travelling apparatus, and generally encases them in thick flannel or cloth. Such bottles pack well, and not only does the flannel casing prevent breakage, but supplies the means, in summer time, of cooling down the liquids contained therein; since it is only necessary to damp the flannel in order to set up active evaporation, which reduces the temperature of the contents by several degrees.

Another point in connection with Mr. Barton's tent is worthy of mention. We have before stated that it is raised but little from the ground, a feature that gives additional stability to the structure, and permits the worker to sit at his labours. But the tent is so constructed that half of the bottom may be allowed to fall at will, like a trapdoor, to ensure ventilation, when this is desired, the heavy vapours of ether and alcohol thus finding ready exit. Of course the bottom must not be lowered when the sensitive plate is likely to suffer, but when the latter is in the bath, or partially developed, there is little fear of injury, for the tent being low, the diffused light coming up from underneath has scarcely any action at all.

Another method of waterproofing paper Make a weak solution of glue or gelatine, and add to it five per cent (in volume) of acetic acid, and seven per cent. of a saturated solution of bichromate of potash. The paper is simply drawn through the mixture and hung up to dry; care should be taken, however, to screen the mixture from daylight before and during the process of waterproofing.

We have all heard of Mr. Muybridge's wonderful photographs of a horse in the act of galloping, and how photography has shown that the animal lifts his legs in a manner which would have been declared unnatural if it were not unquestionably the truth. Mr. Muybridge, it seems, has now photographed several horses on the move, and the pictures put into a zoogyroscope—an adaptation of the zoetrope—show the animal trotting or galloping. Not only this, but a spectator looking at the series in a zoogyroscope is said to be able to recognize the horse by its action. Thus, some time since, the photographer showed in the zoogyroscope a mare galloping, which he said was Phryne Lewis. Governor Stanford declared that he knew the action, and it was Florence Anderson; and so it proved to be.

This incident of recognition by means of a phantom image—for the series of moving photographs produce a sort of phantom horse galloping—reminds one of the startling instance of recognition by a mirage recorded by Mr. Scoresby in 1822, in the Proceedings of the Royal Society. During his voyage to Greenland in that year (a locality especially favourable to the phenomenon known as the mirage), Mr. Scoresby observed on the horizon the inverted image of another ship, and this latter, examined carefully by a telescope, Mr. Scoresby was able to identify by sails and rigging as a craft in which his father was a passenger. On comparing data subsequently, Mr. Scoresby was found to be correct in his assumption, the vessels having been thirty miles distant from one another at the time.

A correspondent from Thuringia tells us that an original MS. of Goethe was rescued from fire by photography not long ago. The great German poet was in the habit of spending a night now and then in a summerhouse upon the Kickelhahn, a hill in the vicinity of Ilmenau, and here, overlooking the black pine forests, some of his finest inspirations were drawn. The well-known "Ode to Night,"

"Ueber allen Gipfeln
Ist Ruh'
In Allen Wipfeln
Spürest du
Kaum einen Hauch
Die Voegel schlafen im Walde;
Warte, nur balde
Ruhest du auch."

was scribbled in pencil upon the door of the little cabin, and for many years they remained an object of pilgrimage. To prevent loss by relic-hunters—one yellow-headed Englishman is said to have been found in the act of sawing the writing out of the deal door—the authorities determined to have the lines photographed, and this had not been done many months before the Goethe summer-house was burnt down. Lately, another structure on the same model has been built on the place of the old one.

Topics of the Day.

PHOTOGRAPHY AND ART.

BY LYDDELL SAWYER.

I trust I appreciate the many advantages derived from the substitution of gelatine for collodion plates in photography; but, at the same time, I consider that, if we do not accept isolated cases, the results have deteriorated from the standpoint of art since the introduction of the former.

With occasional exceptions, photographers appear to me to have ever a preference for emulating the technicalities of their contemporaries, rather than a desire to cull the blossoms of art from their recognised beds, and to engraft them on to the roots of their own fostering. The introduction of gelatine seems to have increased this carelessness amongst us, until now there is generally a complete deviation in the two paths of art and photographic art.

The painter or engraver, and the photographer, most decidedly aim at a different end; we have every day proof of it. Notice how much depends on the bold yet careful massing of light and shade in the works of those great exponents of true art—Lawrence, Reynolds, and Gainsborough; see how eagerly they grasp the artist's licence, and obtain shadows from imaginary objects that they may bring the minor parts of their pictures into submission, and thus add lustre to the high-lights! All the picture pays homage to the face, and its different portions artfully guide the onlooker to this grand culminating point, producing the same soothing sense of completeness as we experience in music when a masterly-arranged *crescendo* works itself into a bold *fortissimo*.

Observe the small amount of white colour used, and yet who can take exception to the purity and brilliancy of the draperies, with the blending and softness even in the greatest contrasts, and say, is it not only a faithful reproduction of nature? Endeavour to conceive what the works of these masters would be without this attention to breadth of light and shade—or, rather, do not put that stress upon the imaginative powers, but, instead, look upon the latest attempts of some of our modern photographers, and there we may see the contrast fully recorded.

To provoke comparison with medium-class photographers might, for sufficiently obvious reasons, be odious; but when we have work before us of those men whom the world declares to be our leaders, who have only to desire an alteration, and the length of their purse is an "open sesame," who have every latest appliance at hand, and whose ample time is bestowed on photographing actresses with unlimited wardrobes—then I think we are excusable for expecting to see the extent to which photography can embody art. Excusable or not, we find these expectations very shabbily realized—at least, in one respect So long as photography extended principally to "cabinets," and when 8½ by 6½, or larger sizes, usually pourtrayed only the bust, then the requirement for knowledge in breadth of lighting was not so much felt; but now that "promenades," "drawing-room," and sizes still much larger are so much in vogue—their peculiarity being that they show the whole figure—then it is obvious that the great expanse of body and picture requires regulating in the lighting by some such code of rules as guides other artists. Yet, so far as I have seen, with some exceptions, this requirement is conspicuous principally on account of its absence.

Here is a series of such photographs brought prominently before the public. The uneducated observer might in reason momentarily conclude that the fair damsels were contesting for whose dress possessed the longest train, so earnestly do many of them obtrude these fan tail appendages into view. But this is only a secondary defect, if defect I dare call it: the prominent objection is the pervading evanescent character of the lights and shades from the centre of the picture to its extreme edges. Where the background ends, it is invariably as forcible as any other part of it. So with the dresses, they are most frequently white, and they may, as probably as not, have the brightest light at the bottom. In short, there seems only a number of indiscriminately-placed lights and shadows scattered about, with little or no pre-conceived idea or object.

Understand, I am treating only of the photographic failure in the massing of the lighting, and this is caused by the photographer's knowledge not increasing in the same proportion to the increasing size and the altered requirement of his productions. Nor can we wonder at this when we consider how small is the percentage who have started photography with an artistic education.

In pre-Raphaelite ideas of detail, however, we are well advanced, owing to our gradual development in that branch, and instigated through continued emulation of each other; but this treatment is no more suitable, for at least certain sized photographs—such, for example, as those I have enumerated—than miniature colouring would be for a life-size painting. The mass of our photographers do not seem to perceive this. They continue widening the breach between photography and the confirmed principles of art by ever continuing to produce, irrespective of the actual requirements of the picture, increased fineness of detail.

Gelatino-bromide of silver, I consider, lessens the art qualities of a negative, through the difficulty of obtaining uniform density, and thus, in a measure, taking the distribution of lighting into its own hands. Moreover, almost all its failings eventuate in the same drawback, whether it be through flatness of image, due to chemical decomposition of the gelatine, or heaviness of contrast, owing to under-digesting and subsequent lack of exposure. This is *the* weak point in gelatine, while its virtues otherwise are doubtless numerous enough; but this one objection acts particularly against the success of the operator, on the point of which I am treating.

Another circumstance why the photographer fails to more frequently produce works of art is one that no artist could hope to cope with successfully. I allude to the defects in the objectives used in photography, and their inability to register the varied modulations of light and shade as they are visually depicted. This is owing, certainly, to no fault of our opticians, who are limited in their power, and have had to hearken to the incessant clamour for rapidity; but now that the necessity for such baneful tension no longer exists, should not this event be heartily welcomed? Yet I have seen no one notice this boon, save Mr Jabez Hughes in his able contribution to the Year-Book. As this gentleman says, it is an unrecognized and one of the greatest advantages obtained through gelatine plates, making it possible, I think, for photography to advance in the direction of fine art, in place of, as hitherto, slightly reducing its claim to that elevated position.

In conclusion, let us see what rapidity we really sacrifice in exchange for these advantages. The average intensity ratio of the portrait lens principally in use is about 1-3, and of the rectilinear or symmetrical averages $7\text{-}7\frac{1}{3}$. Multiply each denominator by its own numbers, and in the quotient we have the relative rapidity of the two classes of lens in seconds: thus, $3 \times 3 = 9$, this being the comparative rapidity in seconds of the portrait lens, and $7\frac{1}{3} \times 7\frac{1}{3} = 53\frac{2}{3}$ and a fraction, being also the comparative rapidity in seconds of the slower objectives.

From these calculations it is evident that in round figures a symmetrical or rectilinear is six times slower than an ordinary portrait lens. This, I admit, appears a grave disparity; but although *workable* gelatine plates of twenty to thirty times the rapidity of collodion plates are, as far as my experience goes, "still to come," yet it is no fallacy to believe them six to ten times as quick, and here we are lifted to at least an equality with the wet process, while the other advantages still remain with us as "extras."

Moreover, how about the opticians giving us further aid? I know that in a measure, like Paddy with his blanket, they can only lengthen the top by cutting it from the bottom; but we can spare something from the bottom in the shape of the rectilinear or symmetrical depth of focus, if the thereby lengthened top represented increased rapidity.

I am only imperfectly acquainted with the qualifications of Ross' Universal and Dallmeyer's D lenses; they should be more what we require; I am purchasing one of the latter with that anticipation solely. I hail the coming season with great hopes, and feel sanguine that by the further co-operation of gelatine plates and photographic lenses, it will eventually be equivalent to a misnomer to—at all events in its higher aspirations—individualize photography and art.

The "Topic" for next week will be "A New Method of Backing Plates," by Dr. Fol, of the University of Geneva.

FRENCH CORRESPONDENCE.

Suggested Application of the Woodbury Process—Photographic Copyright—How can a Work of Art Cease to be so, because it has been Executed by a Photographic Process?—Banquet of the Photographic Society of France—New Woodbury Process at the National School of Decorative Art—Second Edition of M. Poitevin's Work on Printing in Salts of Silver.

Suggested Application of the Woodbury Process.—It is rather surprising that, for the comparatively long time since its invention, the new Woodburytype, a process which is unique in its way, and which could not be replaced by any other, should have been confined to taking prints on paper, on glass, and on mica. Already on several occasions I have pointed out how it would be possible to apply the process to the decoration of high class furniture. If my ideas were carried out, it would offer a great opening for the extension of the Woodbury process, and at the same time it would enrich our industrial arts with the means of decorating artistically and at a low cost a great number of objects of common use. On plates of copper, of silver, or of gold, either polished or mat, ornamental Woodburytypes could be taken, which could be used for decorating furniture by inserting them wherever they might be desired. The cost of these prints would not be higher than those on paper, and if the choice of subject were made with discretion, very rich effects might be obtained; they would at the same time be of great value from an artistic point of view. By applying the various polychrome processes, which are now so well known, in combination with these metallic plates, various effects of colour might be arrived at; and panels decorated in this way would not only be preferred to those made by hand, they would also offer the advantage of being produced rapidly in considerable number and at no high cost. For a long time this idea has been haunting me, and I foresee the possibility of making numerous applications of the process to the decoration of book-binding, portfolios, caskets, cabinets, frames, carriage panels, &c.; also to that of boudoirs, and other rooms where every corner is decorated. It seems to me that there is a good opportunity for pursuing this subject, and I draw the attention of my readers to it in the hope that some-one may see what promise there is in this, as yet, unexplored path, of which the possibilities are much greater than I have been able to indicate above.

Photographic Copyright.—As I am on the topic of industrial art, I should like to say a word also for the fine arts, and in default of news of a technically photographic character, to recur to the question of legal copyright in photographic works. Without doubt this question is now being greatly discussed, and no long time can elapse before it is settled. The report of the Parliamentary Committee to which the Bill on artistic copyright was referred has just been distributed to the deputies, and this leads to the belief that before very long the Bill itself will be found on the order of the day of the Chamber. This report, of which I have been able to obtain an abstract, is unfavourable to the reproduction of photographic works, which, as I have previously stated, are excluded from the Bill of which I am now speaking, and are remitted to a special Bill, which has not yet been drawn up. The object of French photographers is to obtain a suppression of the restrictive clause which excludes photographers from the law on artistic copyright, and we demand that photographic works should be placed legally on the same footing as those of the other graphic arts. A committee is actively taking steps to release photography from what we may call this moral degradation; and they have taken care to get their report distributed to all the deputies. But alas! as this is purely an artistic question, in which politics play no part, there is great reason for fearing that the Bill will be passed in its present state, and that original photographic works will still be left outside of the law of copyright. That this will be a great evil there can be no doubt, for the restriction will open the door to constant confusion, so that the victims of piracy, until a better arrangement prevails, can only be indemnified by having recourse to the common law. This is manifestly insufficient, for by common law no continuous penalty can be inflicted.

How can a work of art cease to be so, because it has been executed by a photographic process?—The moral consequences of such an argument are not less injurious than the legal ones. A work of art, although it may be recognised as such by all who examine it, will no longer deserve this title when it is found that the means by which it has been produced is a photographic one. It will, therefore, from henceforth become necessary, in order to form a proper appreciation of works of art, to undertake an inquiry into their paternity. If they are found to be the fruit of the union of the talent of even the most skilful artist with the marvellous processes of photography, they will be held to be illegitimate, and not entitled to a place in the family of the fine arts. Their birth will be branded with such a stain that they can never be admitted into the higher regions of art; they must be relegated to a sphere of their own. Now it seems to me that there is something here which is the result of an error or of prejudice. Up to the present, I have been labouring under the idea that a production considered to be a work of art before it was known by what means it was produced could not be held to be less worthy of this title merely because it had been executed by one method rather than by another. I must confess I shall have great difficulty in reconciling myself to these distinctions, which appear to be without a difference.

Banquet of the Photographic Society of France.—The annual banquet of the Photographic Society of France was held on the 16th of March last. Everything passed off most successfully, and a fresh opportunity was afforded to the friends of photographic art of binding still more closely the bonds by which they are united. M. Davanne proposed the toast of the *Chambre Syndicale de la Photographie*, and it was most warmly received.

New Woodbury Process at the National School of Decorative Art.—Thanks to the kindness of M. Lamy, I have been able to follow all the manipulations of the new Woodbury process, as he demonstrates them in the Sunday lectures at the National School of Decorative Art. I cannot help expressing regret that this most ingenious process has not been more widely spread in France; we have been for some time waiting with impatience that the possessor of the patent right, M. Flutinet, should be in a position to divulge it, and to deliver all the tools and materials necessary for working it. It seems that the preparation of the steel plates for glazing the paper has been up to the present the cause of the delay. It is much to be wished that all the appliances necessary for this interesting process may be ready as soon as possible, for, as I have said before, people are waiting with impatience to be able to commence work. I am not aware what are the arrangements for the sale of these appliances, but I hope that no restriction will be placed in the way of either licencees or any others who may wish to buy.

Second Edition of M. Poitevin's Work on Printing in Salts of Silver.—A new edition of M. A. Poitevin's treatise (the original edition is already an old work, for it bears the date of 1862) on photographic printing in salts of silver is at the present moment in the press of M. Gauthier-Villars. I have been charged with the task of completing this second edition by a description of the improvements which have been effected in M. Poitevin's processes. Several fresh chapters from the pen of M. Poitevin himself, containing in great part entirely new matter, contribute largely to its historic interest. The greatest care has been taken in the preparation of this important book. LEON VIDAL.

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No. I.—The Land o' Burns.

In the fall of last year I found myself in Scotland; I had travelled over five hundred miles. I had left a broiling sun to meet a cutting east wind, and the first taste of snow. The sudden change chilled me to the bone. Shiver—shiver—shiver! I really do not think I ever felt the cold so much. And then to ramble up and down the High Street of Ayr, and see "the kilted kimmers wi' carrotty hair" padding it along the "causeways" with bare feet the colour of boiled lobsters! Ye gods! Let me go home for my top boots and my ulster! I remember one Sunday, in Iceland, that an honest native stopped me, and assiduously commenced rubbing my nose with snow. He said he had saved that member from being frost bitten, and in the fullness of my heart I gave him as much as would make him and his family happy upon Scheidam for the next week; but I was not cold *then*; I did not shiver; I did not feel as if the grave was a resting-place "devoutly to be wished for!"

The land o' Burns! Bring me a hot foot-bath, and a drink of a stinging beverage.

"This is Ayr;—this is the land o' Burns!" exclaimed the waiter at the Ayr Hotel, in a triumphant tone, as he placed before me the last-named refreshment. He was a little wiry chap, with the broadest Doric ever I heard. The words were given with such gusts, and, if I may use the phrase, as much as to say, "Here's a crack between the eyes," that I could not help asking who Burns was, and why Ayr was mentioned as being his property?

I bet *that* waiter remembers Geo' to this day, and will remember him to within a short space of his departure from this sublunary sphere. Great sorrow—gasp—stare—turn pale—cling to the table! It is all too weak to convey any idea of his amazement at my query, or to give you any notion of the amount of reproach that he concentrated in the following remark:

"Aye, mon! De ye no ken Burns?"

I felt miserable and wicked at the time—indeed, I felt as if I could commit any iniquity; so, after pressing my head thoughtfully for some time, I asked angrily, "Burns! Burns! who the deuce is Burns?"

"Aye, mon!" was the horrified waiter's answer, "I didna beleeve there wis a mortal beein that wis sae ignorant as you, mon!"

He dropped his napkin in his excitement at this point; whisked it up again, and then, while a satirical grin took possession of his mobile features, he added, "I've nae doubt ye'll be thinkin' Burns is a commercial?"

"Struck me he was in the coal line," I answered, in a careless manner.

"Ye great idiot!" yelled my excitable Ganymede, in the most frantic manner. "He's the Na-etional paewit! Did ye ever here of Tam o' Shanter, Souter Johnnie, or Holy Wully?"

"Hum! I think I know the names; they are betting men, ain't they?—two to one, bar one, you know!"

Again my Ganymede's napkin dropped, but he let it lie this time. I was one too many for him, and all he could do was to stare at me in a most limp and imbecile manner

I seized the opportunity to slip out of the room, and make an attack upon the billiard marker. He was a red-haired, dumpy individual, with a consequential air about him. There was no one else in the room, so I politely requested him to play me a game.

"Fine country this," I remarked.

"Aye mon!—this is Ayr—this is the land o' Burns!" answered the marker, with a theatrical flourish of his cue.

"Ye-s," I answered, doubtfully; "ye-s; but—but who is Burns?"

I gained a score that time, for the marker fell against the table, and lost his cannon.

"Aye mon! he's the Na-etional paewit!"

"Yes! yes! I have heard that before, but does he live in Ayr?"

"Hech, mon! he's been deed mair than a hunner years!"

And there was another score to Geo'.

Then, again, when my opponent was nervously balancing his cue for a sweeping stroke, I added, severely, "What do you mean by telling me about a man that I shall never see? And how can this be his land when he is dead?"

"Aye, mon; bit ye'll be able to see his monument!"

Score—and game—and I went to bed.

Next morning—shivering still, but feel ever so much better after hot breakfast. A post card!

"Dear Mr. B.—Hearing that you are in the Land o' Burns, our 'mutual friend' requests me to intimate that a photograph or two of the 'Brig o' Doone' and the 'cottage' would prove a marketable commodity.—Yours ever,

"B. B."

This chimed in very well, for I intended to have a sight of the world-renowned "cottage." I only wished that it was spring or early summer—that being, in my estimation, the most pleasurable time for out-door work. However, there was no help for it. I likewise was partially reassured by the waiter informing me that it was a "fine caller mornin." I would have termed it a raw, rheumatic morning; but that is merely a matter of opinion. The wind was keen enough to shave me, as we drove along the roads; it came howling up the Channel, raising the "white cats" in beautiful style, and swept over the bleak and deserted "links" in a very angry and winterly manner; so that you may suppose I was not sorry when we drew up at the little door of the thatched cottage wherein Burns first saw the light of day.

I had taken with me half-a-dozen of Swan plates, a half-plate camera, and a lamp fitted with ruby glass to change the plates by, as I intended to develop them later on. After I had explained that any small room would suit, that I would not require any water, or have filthy chemicals splashing about—"drugs," the good lady termed the latter—I was accommodated with a small back room, divided by a "hallan," or partition, that reached to within a foot and a-half of the low roof; there were likewise a couple of fixed benches and a table, that the worthy bard might have sat at, for the matter of its antiquity. On this ancient festive board I did my changing.

The first plate, of course, was the cottage; three seconds' exposure, and return to my changing room. While I had the plate-box open, a flash of something made me raise my eyes to the hallan. O, horror! a gleam of white light! My lamp hung on about a level with my face, in such a position that the rays fell full upon the plates on the table. I had heard so much about the smallest particle of light spoiling these extremely sensitive plates that I deemed the lot in my hands useless. However, seeing that I was there, there would be no harm in trying them. I excluded the light, which proceeded from a door that had been opened during my absence, and went to work with them. But there was no more fun for me; that gleam of light took the whole of the sunshine out of me, and hung on my mind like a millstone. Alloway Kirk, had it been choke full of witches and cutty sarks, would not have stirred me. Had Tam o' Shanter and Souter Johnny come to life, and entreated me to share their "sneeshin usquebach and tipenny," that glimmer of light would have spoiled our revels. And I had to wait until the morrow before I could ascertain whether I had "spoiled a spoon or made a horn."

I may here come at once to the development. I used the ferrous oxalate—Dr. Eder's formula—as described in the News, April 9th, 1880, with just one alteration—viz., that the solutions were mixed hot, then filtered, and used cold. With an eager hand I mixed the solutions, and commenced operations. To my delight and amazement, there was not a particle of fog; one after the other, the same result! Now, what could be the reason of this? After a little thought I came to the conclusion that the ruby rays directed down upon my plates excluded the light from above as securely as if the space where they lay was enclosed in glass—I mean, that if I had by accident moved the plates out of the ruby rays up to where the light shone on my face, *then* they would have been spoiled.

I felt rather jollier that night than on the preceding one. I remember gazing gloomily at the fire that night, and thinking that I had surely found my way into a city of the dead; I heard nothing but the praises of the bard of Ayr sung. In one place they will sell you a drink of whiskey out of a horn measure that had been used by Burns; in another, you can sit on a seat once honoured by him; at every stationery shop, and at the monument, you will be pestered by having miniature cups, saucers, needle-cases, albums, &c., with pictures and inscriptions telling you that they were made from wood that grew on the Banks o' Doon. At the Cottage, they hush you in on tip-toe to look at the dingy box-bed where the great poet was born. This spirit pervades the whole place, and a laudable and patriotic feeling, indeed, it would be, were it not that the spirit of gain accompanies it in such palpable form. They show you his mother's bed for money; they show his monument for money. Burns and money! Burns in the flesh had little to do with money; and when one has gone through the "Land o' Burns," and seen every little relic shown for gain, one cannot but think of that poet's mother, and echo her bitter remark, when she looked upon his monument, "He asked for bread, and you have given him a stone!"

ACTION OF LIGHT UPON THE SOLUBLE IODIDES.*

Dr. Smith furthermore states:—"3. It is known that strong acid liberates iodine. Weak acid does so after a long time, but the process is hastened by light." This generalised statement may lead to confusion and error, if left unqualified by a precise idea of the conditions under which it is false, and those under which it is true. For when oxygen is excluded, "decomposition of an acid solution of potassium iodide occurs only after the concentration has attained to some point between one-third and one-tenth the weight of the water employed."

The acidifying body referred to in the experiments quoted is sulphuric acid, and a more precise limit of concentration is not given, because of the undue multiplication of trials thereby entailed. But decomposition ensues in this instance from the production of an entirely different set of conditions on the attainment of the limit, and the sulphuric acid splits up, thereby furnishing the essential oxygen by an endo-chemical change. Instead of—

$$4KI + 2H_2SO_4 + O_2 = 2K_2SO_4 + 2H_2O + 2I_2$$

(Eq. 2, §X., 3rd paper), the equation given for this case is—

$$2KI + 2H_2SO_4 = K_2SO_4 + 2H_2O + SO_2 + I_2 \text{ (Eq. 1).}$$

Dr. Smith goes on to state—"4. Heat even to the boiling-point does not act so well as light (experiments being made in sealed tubes to prevent loss of iodine)." Unfortunately, Dr. Smith could not have arranged the conditions of his experiment in a manner better calculated to lead to false conclusions. For, in sealing up the tubes, he prevented the access of oxygen, the very element whose presence is essential to the occurrence of the reaction with dilute solution, whether the experiment be performed in light or darkness, in the heat or cold. And the sum total of the iodine which Dr. Smith could have liberated under the conditions given, even had the tubes been kept at the boiling-heat for several degrees above (see results obtained at 105°, *supra*) for hours, would have been the small amount equivalent to the oxygen sealed up at the same time with the solution in the tubes.

It is possible that, in the experiment performed by Dr. Smith, a small amount of the dilute nitric acid may have undergone decomposition by heating into hyponitric acid and oxygen. But this is extremely improbable, and there is reason for believing that the total amount of iodine set free in the experiment cited was the exact chemical equivalent of the oxygen of the air which was sealed up at the same time with the acidified solution in the tube. And, as a corollary to this proposition, had Dr. Smith taken the precaution to exclude every trace of free oxygen from the tube, even with the dilute nitric acid no change of the potassium iodide solution would have occurred on heating to boiling-point, and on continuing the heating for hours.

The seventh point is: "The solution of iodide of potassium as hitherto obtained is subject to change. An old solution—that is, one nearly a month old—was found more sensitive than a new one in all cases tried." I find it difficult to understand the precise meaning of the epithet "sensitive" as applied in this connection, unless the sensitiveness be due to a decomposition of nitric acid employed, and a corresponding liberation of iodine. Instead of being styled sensitive, the solution might with more propriety, perhaps, be termed spoiled, and as such unfit for employment in actinometry.

---

* Continued from page 143.

Dr. Smith states, in the ninth place, "The amount of allowance for temperature is not made out. It is not certain that any is required in the cases when weak acid is used. The weather has not allowed any combined action of great light and heat; but with heat and light in the rays from an electric light with a parabolic reflector the action was very rapid." I do not find in the experiments detailed by Dr. Smith upon the effects of temperature (see above) a basis for the above generelisation. Neither do I perceive the reason for this dependence upon the weather, when it might be deemed the essential pre-requisite of accurate experiment that the changes due to the two separate causes should be carefully discriminated, and the effects properly assignable to each determined by previous trials under conditions admitting of exactitude and control. Nor do I recognise a test of the latter character in the experiment performed in the concentrated beam from an electric light.

Finally, the manner in which the iodo-acid method is applied to solar actinometry appears irrational. For Dr. Smith proposes to expose this actinometer during successive hours of "sunshine and cloud alternately"—during times when the weather is "changeable," during intervals of "sun and showers," during weather which is "foggy, with a gleam of sunshine." In what way is the value of a meteorological observation enhanced by knowing that, during periods in which the sun may or may not have been shining, a few milligrammes more or less of iodine were set free in an acidified solution?

When, however, we call to mind the frequent experience in photography, that there are states of the atmosphere when, with a clear sky, the quality of the light does not appear to be favourable to the making of a successful picture; or the fact previously noted, that, no visible change being manifest in a brilliant blue sky, the curve of chemical intensity underwent a great depression; or note the immense amount of chemical work done as the horizontal ray passes through the myriad organisms and pestilential germs, miasms, vapours, and countless emanations from the earth's surface that admit of oxidation under solar influence,—then, I think, we become impressed with the large practical value of an easy and rapid method of actinometry. The actinic component of the solar ray has its units of work, as well as the thermal, and the day has come when, in the utilisation of available energy, it will repay us to economise the forces in the sunbeams at present wasted.

◆

THE MELBOURNE EXHIBITION.

The following additional awards have been passed by the executive.

Jury—J. Hicks, R. Russell, J. Noone, Radinger, G. Moghano, E. Cecchini, E. Klingender, H. Kowalski.

Landscape Photography, Including Photographs of Buildings.

First Order of Merit.—All Equal—Bourne and Sheppard, of Calcutta; G. Brogie and Sons, Florence and Italy; N. Caire Melbourne; W. Collie, Napier, New Zealand; F. Frith and Co., Reigate, England; Government Printing Office, Sydney; L. O. Greenwold, Breinin; J. Halley, Dinant, Belgium; B. Johannes, Batavia; J. W. Lindt, Collins Street East, Melbourne; Charles Nettleton, Carlton and Melbourne; Skene and Co., Colombo, Ceylon; L. J. Stilmant, Pepinster, Belgium; W. T. L. Travers, Wellington, New Zealand; H. Williams, Greymouth, New Zealand.

Second Order of Merit.—E. Brightman, Bristol, England; F. Cowell, Sale, Victoria; Daveling, Briges, Belgium; L. E. Douffet, Ceylon; F. H. Duffy, Fiji; M'Donald, St. Kilda; J. H. Newman, Sydney, New South Wales; Stillfried and Anderson, Japan; J. J. Taylor, Nelson, New Zealand.

Third Order of Merit.—J. Bragge, Wellington, New Zealand; Brunton Brothers, Dunedin, New Zealand; J. E. Brunton, Cape Town; B. O. Holterman, Sydney, New South Wales.

Portraits Taken Direct—Neither Coloured nor Tinted.

First Order of Merit.—All equal—Anson, Bros., Hobart, Tasmania; R. H. Bartlett, Auckland, N.Z.; H. H. Bayley, Hobart, Tasmania; Bradley and Rulofson, San Francisco; N. Caire, Melbourne; J. B. Feilner, Bremen; Foster and Martin, Collins Street East, Melbourne; Johnstone and O'Shannessy, Bourke Street East, Melbourne; J. W. Lindt, Collins Street East, Melbourne; London Stereoscopic Company, England; Pierre Petit, Paris; E. Rusfeldt, George Street, Sydney.

Second Order of Merit.—All equal—N. K. Cherrill, Christchurch, New Zealand; Clifford and Morris, Dunedin, New Zealand; S. Cornell, Napier, New Zealand; J. B. Feilner, Bremen; G. Nesbitt, Bournemouth, England; Rudolph and Gasper, Goulburn, New South Wales; Tuttle and Co., Melbourne and San Francisco.

Third Order of Merit.—Bennett, Brisbane, Queensland; W. B. Gibbs, Wellington, New Zealand; H. M. Hull, Hobart, Tasmania; C. F. Niesche, Adelaide, South Australia.

Coloured and Tinted Photographs.

First Order of Merit.—All equal—Mrs. Bennett, South Yarra, near Melbourne; Foster and Martin, Collins Street East, Melbourne; Johnstone, O'Shannessy, and Co., Melbourne; A.E. Taylor, Melbourne.

Second Order of Merit.—All equal—J. H. Boyd, George Street, Sydney; Miss H. Hambridge, Kensington, South Australia; J. H. Newman, Oxford Street, Sydney.

Third Order of Merit.—Edward Renard, France.

Enlarged Photographs, whether Portraits or Landscapes.

First Order of Merit.—All equal—G. Bordli, Rome, Italy; Government Printer, Sydney; Vernon Heath, Piccadilly, London; Johnstone and O'Shannessy, Melbourne; J. H. Newman, Oxford Street, Sydney; Colonel Stuart Wortley, England.

Second Order of Merit—J. R. Brennand, Prahran, near Melbourne.

Heliotypes.

Second Order of Merit.—Hart and Roux, Wilson Street, Sydney, New South Wales.

◆

Correspondence.

GELATINE *VERSUS* COLLODION.

Dear Sir,—In your "At Home" in the News of March 18th, Mr. Grove says he will return to the use of wet collodion as soon as possible, and as far as I can ascertain, there is a large majority of photographers who will do the same; as despite the usefulness of gelatine dry plates in dull weather, there is still a prevalent feeling that collodion gives the finest results when it is possible to use it.

Now that alkaline development is so well understood and practised, I would suggest to portraitists who hanker after the pluck and vigour of a good collodion negative to give a trial to washed collodion emulsion, and use it wet. Coat a clean plate with emulsion, allow it to set, and place in dark slide for exposure. What could be simpler? The development will take far less time than a gelatine plate, and not much more than a bath plate, and, above all, intensification is under perfect control. As regards exposure, I did a few experiments in India and Ceylon, and found wet emulsion about twice as quick as a bath plate, and should have then given emulsion a fair and extended trial if I could have got the emulsion when I wanted it.

Another point in favour of collodion emulsion is the immense latitude of exposure. I have a plate with two exposures upon it, one with five seconds and the other thirty seconds, but they both print exactly alike.—I remain, dear sir, yours faithfully, W. T. Wilkinson.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Sir,—Will you kindly permit me to call the attention of your readers to the next meeting of the above Society, to be held on Thursday, April 7th, at 8 p.m., in the Rooms of the Society of Arts, Adelphi. The admission is free, and the Committee will be pleased to see as many as possible

Arrangements have been made for the practical exhibition of various lenses and condensors for the optical lantern; also of lanterns burning a light other than gas.

Mr. W. T. Morgan has kindly promised to give a practical demonstration of his Argentic Gelatino-bromide paper. Mr. Morgan will make an enlargement, size 30 by 22, and develop the same before the meeting. Enlargements made on this paper will also be exhibited.

The Committee trust that as this meeting will prove one of exceptional interest, many members, and photographers generally, will avail themselves of the privilege of attending.—I am, yours, &c.,

H. Garrett Cocking, Sec.

ALUM IN PHOTOGRAPHY.

Dear Sir,—With reference to Mr. Burton's letter in your issue of the 18th inst., I would say that developed dry plates may, in my experience, be exposed without hurt to white light, if they are first treated with alum for a short time. This substance, which is growing more useful every day to photographers, appears to possess the property both of destroying the latent image on an exposed plate, and of rendering an unexposed film insensitive to the action of light. At least, I have failed to get even the faintest image on a sensitive plate, treated before exposure for a few seconds with an aqueous solution of alum, and well washed and dried; or to develop an exposed plate rinsed with alum before immersion in the pyrogallic. Under these circumstances, it was only natural to suppose that immersion in alum after development would destroy the last trace of sensitiveness to light in a film; and such appears to be the case. I have exposed an unfixed dry plate, treated with alum and well washed, for several hours to broad daylight, and on fixing, not the slightest veil has been perceptible. Here, then, is an additional argument—if any be needed—for the use of the alum bath.—I am, yours,

C. E. Wyrall.

Proceedings of Societies.

Manchester Photographic Society.

A special meeting of this Society took place at the Manchester Mechanics' Institution, Princes Street (late David Street), on Thursday, the 24th inst., Mr. Alfred Brothers, F.R.A.S., President, in the chair.

It was resolved that the large hall of the above Institution be engaged for the place of meeting during the next session, and that notice be given to discontinue the use of the rooms at the Memorial Hall.

A lantern exhibition concluded the proceedings.

The Photographic Club.

At the meeting on Wednesday last, Mr. F. Howard exhibited his method of packing gelatine plates. Each pair of plates, placed back to back, is bound together by four corner-caps of paper, and any number of these pairs can be piled on each other without fear of damage; it being merely necessary to place a single plate, film inwards, at each end of the pile, and to fasten the bundle with india-rubber bands, or with string. One great advantage of this system is the ease with which the plates can be packed in the dark; and, moreover, the same corner-pieces are suitable for plates of every size, excepting that, in the case of very large plates, it might be advisable to employ rather thicker paper or card in making the corner-pieces.

The corner-pieces can be made by hand very rapidly, although if they should be extensively used by manufacturers of commercial plates we apprehend that they will be formed by machines similar to the envelope-folders now in use. A small piece of paper, about the fiftieth of an inch thick, is folded over the angle formed by a double thickness of glass, and then another similar piece of paper, previously gummed, is lapped over in a contrary direction.

Mr. Howard also handed round the bottom of a ginger beer bottle which had become incrusted with a compact and dense deposit, which doubtless consisted of silver bromide. The bottle had been used repeatedly for emulsifying gelatino-bromide, and it would be an interesting matter to investigate the reason why the haloid salt of silver should agglomerate into a hard and possibly crystalline form. This point is of interest as bearing on the theory of emulsification; especially as regards the view that during this process the bromide becomes actually dissolved, and is subsequently re-deposited in that more granular form which is so extremely sensitive to light.

Talk in the Studio.

A Photographic Gathering.—On Saturday last, nearly one hundred photographic friends sat down to a sumptuous repast at the invitation of Messrs. Mawdsley and York, at the extensive Dry Plate Works of Mr. Mawdsley at Notting Hill. The toasts were: "The Photographic Society of Great Britain," responded to by Mr. T. Sebastian Davis; "The South London Photographic Society," acknowledged by the Rev. F. F. Statham (who, by the way, seems identified with all photographic gatherings) "The Photographic Club," coupled with the name of Mr. Bolas, and "The Hosts," by the Rev. Mr. Statham. Mr. Cobb amused the company with an original song, in which he humorously referred to recent events, and to the surprising progress which has recently been made in dry plate work.

To Correspondents.

C. E. Wyrall.—1. You must have been misinformed. 2. You will find abundant information as to recovering silver from old wet plate developing solutions in back volumes. Pyrogallic and silver intensifiers can be treated in a similar manner.

A. B. C.—Certainly not. Consult a solicitor.

A. N. Leicester.—We are inclined to think that you must have blotted off or dried the prints with a sample of paper containing hyposulphite. Contact with bronze powder will sometimes cause a similar phenomenon.

Fred Luciana.—1. Any of the ordinary commercial plates will answer, and for the purpose we should advise a ferrous oxalate developer. Contact printing is most convenient when no alteration is required as regards size. 2. Soak for some hours in a saturated solution of alum, wash well, and intensify with pyrogallic and silver, as in the case of a wet plate.

Captain Turton.—Although, in many cases, the utmost purity is necessary—as, for example, in the case of silver nitrate—it often happens that impure commercial products answer perfectly. The same holds good also in the case of chemicals intended for medicinal use.

Sigma.—See answer to S. H. G. in our last number.

G. S. M.—A much smaller quantity will suffice, but excess will do no harm provided that the directions are carried out. Of course you must filter carefully.

A. L. T.—1. Sandarac, 2 parts; alcohol, 7 parts; oil of lavender, 1 part. 2. Mastic, 40 grains; sandarac, 160 grains; ether, 4 ounces; benzole, 3 ounces. 3. Gum dammar, 1 part; benzole, 12 parts. 4. From any photographic material dealer.

Goring.—Our Publishers cannot help it; they have simply no more of those numbers in stock. We shall have some more portraits of Fox Talbot next week, and if you apply again, you will be supplied.

W. J. Hunter.—We cannot find it just now, but will look for it. Try a weak solution of cyanide, such as is used for clearing negatives.

R. Dumaresq.—You will probably meet with a suitable tenant by advertising in our columns; or apply to Messrs. Hunter and Sands, 20, Cranbourne Street, London, W.C.

C. S.—1. By enquiring at Stationers' Hall. 2. Our Publishers see to the registration of photographs for a fee of 1s. 6d. each.

J. M. Smith.—Place the untoned positive print in a saturated solution of mercuric chloride until the image disappears. The other is blotting-paper which has been moistened with a saturated solution of sodium hyposulphite, and dried.

L. Baxter.—A thin film of plain collodion.

Nemo.—Soak the plates in a solution of caustic soda for a few days.

Tom Kendal.—1. Ferrocyanide of potassium. 2. You have dried the tissue too quickly, or at too high a temperature. 3. Try the addition of twenty drops of glycerine to each ounce.

Several Correspondents in our next.

1.4 81

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1179.—*April* 8, 1881.

CONTENTS.

PAGE
The Backing of Dry Plates ... 157
Printing; and the Burnishing of Prints ... 157
A Chemical Actinometer. By Professor H. Dufour ... 158
Photography In and Out of the Studio ... 159
By-the-Bye—Vanity Fair ... 160
Notes ... 161
Topics of the Day—A New Method of Backing Plates. By Dr. Hermann Fol ... 162
Glazing Studios without Putty. By J. C. Stephens ... 163
My Dark-Room. By Marshall Wane ... 163
PAGE
Touching and Retouching. By M. P. B. ... 164
On Paper Negatives by the Gelatino-Bromide Process. By H. J. Palmer ... 165
The Portable Stereoscope and Panoramic Slide. By W. Harding Warner ... 165
Correspondence ... 166
Proceedings of Societies ... 167
Talk in the Studio ... 168
To Correspondents ... 168
Patents. Compiled by Des Vœux and Colton ... 168

THE BACKING OF DRY PLATES.

Dr. Hermann Fol contributes a valuable topic on this subject to our present issue, and we congratulate him on having studied his subject and made his investigation in a true scientific spirit. Having traced reflection from the back of the glass to the circumstance that a large difference exists between the refractive energy of glass and air, he points out that the coating of glass with a body of high refractive energy entirely prevents reflection at the plane where the glass terminates; and if this highly refractive body is intermingled with some pigment or stain which obstructs the passage of or absorbs actinic light, the phenomenon of blurring is entirely prevented from manifesting itself. As regards the fulfilment of these physical conditions, the black-varnish backing which we proposed some months ago is perfectly satisfactory; but Dr. Fol complains that it prevents the progress of development being properly traced, and, moreover, it is unsuitable for use in the case of wet plates. A mixture of glycerine and gelatine forms the basis of Dr. Fol's backing, and this mixture is spread in uniform layers on linen, paper, or some other convenient flexible base, a little indian-ink being added as a colouring ingredient. Professor Fol's idea of utilising the half-used carbon tissue which is stripped off in the process of developing carbon prints is ingenious; but, instead of doing this, we have found it more convenient to make use of fresh tissue. A number of pieces, being cut to the required size, are soaked in water until thoroughly softened, after which they are allowed to remain in a dish of glycerine for twenty-four hours. At the end of this time they are all squeegeed, face downwards, on a large sheet of glass, where they are preserved until required. The tissue thus saturated with glycerine can be brought into perfect optical contact with the back of the plate by a few strokes of the finger; and, as it never dries, it can be removed and put on another plate with remarkable facility. Moreover, the glycerine acts as a preservative or antiseptic, preventing decay or putrefaction.

We cannot but hope that Dr. Fol's method of backing will bring about a reform as regards the quality of photographs of microscopic objects; the examples of this class of work which one ordinarily meets with being often utterly ruined by halation or blurring.

We remember once seeing the effect of immersing a cube of flint glass in a liquid having the same refractive energy as the glass. The cube simply became invisible, and remained so while in the liquid, thus affording a pretty illustration of the principle which guided Dr. Fol in his experiments. As far as we remember, the liquid was an organic compound of mercury.

PRINTING; AND THE BURNISHING OF PRINTS.

In these days of gelatine plates and negatives of varying quality, printing demands very special care and skill. Plate-makers have much to account for in the production of thin negatives and poor prints; but, on the whole, they are, perhaps, more maligned than they deserve. It is always desirable to make the most of one's negatives, no matter what their quality may be, and with this end in view, we look to the printer to help us out of our difficulties. Elaborate retouching works wonders, but careful printing is a perfectly legitimate and satisfactory way of getting over some of the defects caused by unskilful treatment in taking gelatine negatives.

We will venture to say that by far the greater number of gelatine plates at present produced require some special treatment in printing. Some are too transparent, others too dense; while a third class would be just right were it not for a thin veil of fog in the shadows.

We here subjoin some of the points to be attended to in printing special negatives and in finishing the prints with the burnisher.

It is necessary, first, to select suitable sheets of albumenized paper, and to note that the surface is evenly glazed, and free from flaws. When the albumen is thin, the print will lack vigour.

Let us suppose that the negative to be dealt with is weak and wanting in contrast, it will be advisable, in sensitizing the paper, to add silver nitrate to the bath to raise it four or five grains per ounce above its normal strength. This will lend its aid in securing greater contrast in the print. The paper should be dried between folds of blotting-paper, and kept as flat as possible throughout the entire processes of printing, fixing, and mounting. This precaution should be observed more especially when the print has to be burnished. When the paper is hung up to dry, and allowed to cockle, unless the atmosphere is humid, the albumen surface is apt to crack with after-treatment. A defect of this sort can never be remedied by the burnisher.

Next, before printing, see that the varnished surface of the negative is perfectly hard and dry, so as to avoid its serving as a receptacle for dust. Retouching varnishes are liable to remain tacky for some time The negative, being thin, should be printed in feeble light. It is, indeed, advisable, in an extreme case of weakness, to place a mask of *papier mineral* on the glass side of the negative, and upon this to effect what retouching may be deemed necessary to save the print from undue degradation in the lights and feebleness in the shadows

When the print is removed from the pressure frame it should be trimmed to the proper size.

Toning should, of course, be carried on in a very subdued light, and, when finally washing the print, after fixation, it should be placed for a few minutes in a bath of tepid water containing a small percentage of common alum so as to eliminate the last traces of soda hyposulphite.

We now come to details such as shall secure perfect brilliancy in the finished print. The print should be dried between folded blotting-paper, so as to avoid surface markings. While the print is still moist, it should be treated with warm potato starch paste, and at once mounted on its allotted card. The mounted print should not be allowed to become absolutely dry. If perfectly dry it will be found impossible to impart full gloss to the albumenized surface.

A variety of defects are produced by an ill-devised mode of heating the burnisher. When heated with one flame, it becomes too hot immediately above the flame, and imparts brilliancy to a portion of the print only. If, on the other hand, two flames are employed, heat is again unequally diffused, and the differences of temperature registered on the print.

Perhaps the best mode of heating the burnisher is by means of gas and a perforated tube, where the flames issue at short intervals along its whole length.

The sort of card used in mounting prints has something to do with success in burnishing. Enamelled cards are apt to yield up some of the grit of the enamel, and cause scratches of the polished albumen surface.

Before venturing to use the burnisher, a trial card should be inserted in order to establish the pitch, and to see that the pressure is equal over the surface. It is necessary first to rub the surface of the print with a piece of soft flannel carrying a trace of Castile soap.

When the burnisher is too hot, blisters form on the print; these may sometimes be got rid of by allowing the card to cool, and again passing it through the burnisher.

In conclusion, we enter a protest against the system of water-marking applied to albumenized papers. As a suitable substitute for this sort of advertisement, we would suggest that the name of the paper manufactory should be lightly printed on the back at one corner of the sheet, or in the centre of the sheet, but not with a fatty ink. It is certainly annoying to find the name of some manufacturer indelibly stamped along the margin of each sheet, rendering a certain portion of the sheet useless. Burnishing will not remove the name.

◆

A CHEMICAL ACTINOMETER.

BY PROFESSOR H. DUFOUR.*

Instruments for measuring the variations in the chemical intensity of sunlight are called actinometers. The principle of my apparatus consists in counteracting the varying action of light upon a mixture of chlorine and hydrogen by an electrical current of varying intensity, but capable of being measured at any moment. This current effects the decomposition of an amount of hydrochloric acid equal to that which is produced by the action of light on the mixture of chlorine and hydrogen.

The apparatus consists (fig. 1) of two glass bulbs, A and B, similar to those of Rumford's thermoscope, but rather thicker. Into the two lateral necks *t* and *t'* of the bulb A are fixed two carbons which act as electrodes. The tube T enters into this bulb, following its curvature; the same bulb contains a small quantity of hydrochloric acid.

The second bulb, B, which is blown on to the other end of the tube T, contains sulphuric acid. By means of a glass stop-cock, R, the communication between A and B can be completely shut off. The tube T is placed in an inclined position, as shown in the figure. The part *a b* has an interior diameter of only one millimetre, and it is graduated to cubic millimetres.

To prepare the sensitive mixture of chlorine and hydrogen which is to occupy the upper part of the bulb A, and on which the light is intended to act, an electric current must be passed for several hours; this decomposes the hydrochloric acid, saturates it with chlorine, and at the same time diminishes the strength of the acid. We thus obtain a liquid capable of rapidly absorbing gaseous hydrochloric acid, and having above it a mixture of chlorine and hydrogen. When the mixture has attained the requisite sensitiveness, sulphuric acid is introduced into the bulb A, by means of the side tube E; this tube is then closed with the blowpipe. The whole apparatus must be carefully arranged so that the volume of air remaining in the bulb B may be equal to the volume of the sensitive mixture of gases which is in the bulb A.

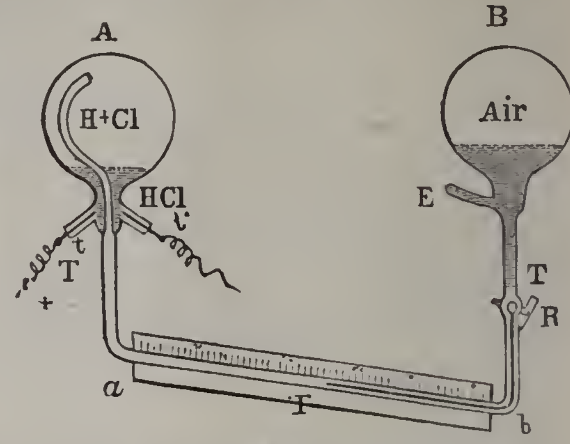


Fig. 1.

The entire instrument is enclosed in a box blackened on the inside (fig. 2). The light is admitted by the two openings O and O', which can be made to vary both in size and in position. The stopcock R is within reach of the hand of the observer, and the tube *a b* appears on the outside of the box, being inserted into a groove cut for the purpose, and lined behind the tube with black cloth. When an observation is to be taken, the two openings O and O' must have the same size and the same position; under these circumstances the instrument is not affected by variations in temperature, which produce equal expansions or contractions of the gases containing the two bulbs.

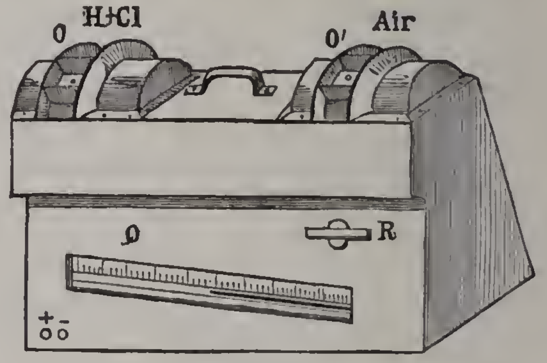


Fig. 2.

By the action of light, part of the chlorine and of the hydrogen, which are in the bulb A, are caused to combine to form gaseous hydro-chloric acid, which is then absorbed. By this action there is induced an increase of pressure and expansion of volume in A, and the column of sulphuric acid is displaced from right to left. To counteract this displacement, an electrical current is passed through the solution of hydrochloric acid; when the current decomposes a quantity of hydro-chloric acid equal to that which the light is continually forming by the combination of chlorine and hydrogen, the column of liquid remains stationary. To measure the intensity of light, it is therefore now only necessary to measure the intensity of the current which suffices to produce this equilibrium.

These observations, which are merely relative, could also be taken by another method. A current is passed sufficiently strong to drive the column of acid back to the zero point, for instance; the current is then broken, and a note taken of the time which the column of sulphuric acid takes to pass over the interval comprised between the divisions 0 and 20, for instance, while the current is no longer passing; thus a series of successive measurements may be taken. It is clear, as the hydrochloric acid formed remains always the same in this method of procedure, that the time required to produce it is longer in proportion as the action of light is feeble, and inversely.

---

* *Le Monde de la Science et de l'Industrie.*

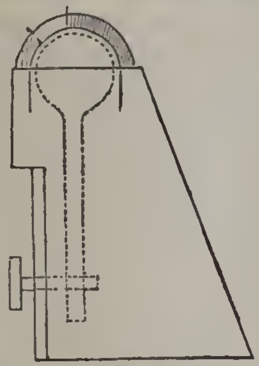


Fig. 3.

Designating by 1 the intensity of the current required to produce one cubic centimetre of hydrochloric acid per minute, I obtained the following results in my observation of the 2nd June, 1880:—

Time.	Intensity of the current required to counteract the action of light.	
8 h. 20 m. a.m. ...	0,041	Sky quite clouded.
8 h. 30 m. a.m. ...	0,037	Mist.
8 h. 35 m. a.m. ...	0,053	
9 h. 55 m. a.m. ...	0,113	Clear.
10 h. a.m. ...	0,103	
10 h. 5 m. a.m. ...	0,097	The smoke of a chimney was passing across the field of the instrument.
11 h. 5 m. a.m. ...	0,079	Grey sky.

By the second method on the 24th June, 1880, I obtained the following results:—

Time.	Time taken by the extremity of the column of sulphuric acid to pass over a given space in the tube.	
4 h. 25 m. p.m. . .	34 sec.	Sky partially clouded, with frequent showers.
4 h. 30 m. p.m. ...	37 sec.	
4 h. 35 m. p.m. ...	54 sec.	Cloudy sky, and sun invisible.
4 h. 36 m. p.m. ...	62,5 sec.	
4 h. 40 m. p.m. ...	219 sec.	Sky very black. Rain.
4 h. 55 m. p.m. ...	185 sec.	Rain, but sky clearer.
5 h. p.m. ...	108 sec.	Sky was cleared up. The rain continued.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Mammoth Carte—The Ancient or Tyrian Purple—Chemistry and Photographers—Gelatine *v.* Collodion.

The Mammoth Carte.—We are not sure whether the new size of portrait pictures, imported from America, about sixteen inches high and twelve inches broad, has already a name; but we think *mammoth carte* would be the most convenient for them, and we imagine that this size will be the *non plus ultra*, if taken direct from life. We think that our American brethren must employ a six inches lens for taking such pictures, and if larger pictures in any future time should come into fashion, the optician will be obliged to construct extra "mammoth lenses" for the purpose. But it is a question whether it would not be preferable to make such pictures by the enlargement process. We are now in a position to make small pictures direct from life quite sharp in a very short time by emulsion plates, and we can easily produce a first-rate transparent positive on glass by contact printing, and from this an enlarged negative in the camera by the ordinary collodion process. In this manner a great many pictures of moderate size (twelve to eighteen inches) are made by British and Continental photographers in the dull season, when it is difficult to work with the less actinic lenses of large size, and we must confess that the quality of these pictures, obtained in this way, is not inferior in comparison with pictures taken direct from life. Everybody in England knows that first-rate enlargements are made by the carbon process, and we think that this enlarging method is not estimated enough. At the last Paris exhibition we remember to have seen enlarged pictures on linen and canvas, made by Mr. Winter, of Vienna, and employed in architectural decoration for rooms. These pictures were of true "mammoth" size, being about two yards long. Winter is working with electric light and a developing process. Would it not be possible to get in this way enlargements which could be employed instead of the magic lantern pictures? In many cases it would be much more convenient to have such enlarged pictures than a magic lantern, especially when the lecture-room could not be darkened in the day-time.

The Ancient or Tyrian Purple.—Dr. Shenk, of Manchester, published a year ago some very interesting observations on this purple dye and its sensitiveness to light. Strangely enough, none of the old Grecian or Roman authors mention anything about the actinic qualities of this dye, so much admired and employed in olden times. But Dr. Eder informs us now, that in the middle age this sensitiveness of the purple dye to light was very well known. It is mentioned by the princess *Eudoxia*, daughter of the Emperor Constantine VIII., in the end of the tenth century, and described in a book edited by the august female author. The princess says: "The purple dye only becomes perfect if the dyed tissue is exposed to sunlight. The sun's rays give it a great intensity, darken the colour, and improve in the highest degree its brilliancy." Until the seventeenth century no further observations regarding this matter were made, but then an Englishman, William Cole, without knowing of the princess' writing, found purple shells on the coast of Somersetshire and South Wales. He observed that the yellow juice of the buccinum, brought in contact with linen or silk, gives a green colour, which is changed by light to purple, and he further observed a smell of garlic during the decomposition of the juice by light. Cole's letter on his observations is dated 1685, and appears in the Philosophical Transactions of the Royal Society. About twenty-five years later Réaumur, the constructor of the Réaumur thermometer, made the same observations. We are very much indebted to Dr. Eder as regards this matter, he having done justice to the merits of the old authors.

Chemistry and Photographers.—How many photographers are fairly well acquainted with chemistry? We think not the majority. We may only comfort ourselves by the fact that the condition of things in other countries is the same. We read an article in the Vienna *Notizen*, where we are told some very curious instances of the ignorance of photographers as regards chemistry. A photographer was accustomed to observe that the water used for washing fresh (not toned) silver prints became turbid (by the formation of chloride of silver), and he supposed that this was necessary for the process. By hazard he used another water which was free from chloride, and was affrighted to see that the water remained quite clear. He asked a chemist what to do, and this gentleman advised him to introduce some handfuls of common salt into the water. The photographer did so, washing all the pictures, which changed their colour to red, and they refused to tone. The writer of the article mentions further the fact that in nearly all photographic studios bicarbonate of soda is to be found, but not the ordinary carbonate. We consider that the latter is of much better action for neutralizing than the former. For precipitating silver from an old positive bath, monocarbonate of soda answers well; the precipitate is washed, and then dissolved in nitric acid, so it is possible in this way to get nitrate of silver from such bath without any melting or reducing. It is well known that for dissolving metallic silver in nitric acid, an abundant excess of nitric acid is necessary. This may be reduced to a considerable extent, but the solution obtained will always possess an acid reaction. This free acid is generally removed by evaporating the solution and gently melting the residual salt. The last operations are not few or very agreeable ones. A method proposed for getting over this difficulty is to take a small portion of the silver solution and precipitate it with carbonate of soda, the precipitate being next washed with water, and then added to the acid solution. In this way the free acid is neutralized, and, after filtering, we have a solution which can be diluted to the degree required for a negative or positive bath.

Gelatine versus Collodion.—A correspondent in our last number expresses the opinion that after a return of the bright weather, the photographer will prefer the wet collodion process to the gelatino-bromide method. We hear the same opinion from the Continent, where it seems the quality of gelatine plates in the market varies more than is the case in England. There is no doubt that the high lights in a gelatine plate are more easily over-exposed than in a wet plate. In a dull season this may not happen, but it very often occurs in the stronger summer light. Even for landscape photography, we think, the dry plates will ultimately be preferred by the majority. The question is, whether it would be possible to avoid over-exposure of the high lights. Dr. Eder says that the employment of hyposulphite in the ferrous-oxalate developer will remedy the effects of over-exposure, and make the picture more soft. He recommends us to take not more than ten to forty drops of a two and a-half grain solution of hyposulphite for about three ounces of developer; the more hyposulphite is taken, the softer is the resulting picture. If too much hyposulphite is taken, the picture changes into a transparent positive. Eder's formula is:

Saturated solution of sulphate of iron ...	15 c.c.
Saturated solution of neutral oxalate of potassium	45 ,,
Solution of bromide of potassium (1·10)	1 to 4 drops
Hyposulphite solution (above mentioned)...	10 to 40 ,,

By-the-Bye.

VANITY FAIR.

Retouching, like most questions, has two sides to it. You may work over the whole surface of a negative with a black-lead pencil, so as to leave not a single trait in its original condition, or you may leave a negative alone with all its technical imperfections upon it; in neither case is the result true to nature. Some might be disposed to argue that, of the two extremes, the latter is at any rate to be preferred, for the hard metallic surface, sometimes imparted to the features of a portrait, is, of all things, the most unnatural, resembling more the smooth aspect of a steel visor than a face of flesh and blood. But then, on the other hand, with equal force, it may be averred that the blonde damsel, who is represented in an untouched photograph peppered all over with ugly spots, and with a face disfigured apparently with the measles or other loathsome disease, is far more deeply libelled. In any case, we fear the portraitist who, in the interests of truth, would push photography so far beyond the limits as to decline interfering with the eccentricities of sensitive film or developer, would very speedily be relieved of his task altogether; there are few of us who care to be represented more ill-favoured than we naturally are.

It must, then, we think, be generally admitted, as matter beyond argument, that the practice of retouching, to a limited extent, at any rate, is not only defensible, but, indeed, absolutely necessary at times, to rectify the vagaries of a camera picture. And here we may remark that camera pictures were inveighed against in this world long before photographers came into it. People used to be posed before a *camera lucida*, and as they sat silent and motionless, the outline of their figures was quickly sketched with pencil or brush. Lawrence Sterne speaks of these portraits in *Tristram Shandy*, and very depreeatingly, too. "Others," he says, "will make a drawing of you in the camera; that is most unfair of all, because there you are sure to be represented in some of your most ridiculous attitudes."

But this by-the-bye. The pose of the figure in a photograph is frequently subject for complaint now-a-days, but not so retouching. Few sitters, strange to say, complain of the use of the pencil. Vanity in this world is so deeply rooted, that if you pander to it, in nine cases out of ten you will succeed in pleasing your visitor. There never was a greater mistake than to suppose it is only a young lady in her teens who is vain of her looks, and none know this better than photographers. In this respect they come into closer relations with the world than any one else; they are the stall-keepers in *Vanity Fair*, and they know but too well the nature of the wares the public like best.

The difficulty the photographer experiences is to hold the balance evenly. He must not retouch to an absurd degree, and yet he must employ the pencil in a measure; always rather more than less than is probably justifiable, if he wishes to find favour with his patrons. We have heard photographers, and experienced men, too, of high standing, vehemently protest that the public will not be satisfied with a true portrait; their ugly points must be fined down, their fine points must be pronounced. Five years at least has to be stricken from their age; while the majority require a rebatement of ten. As we have said, it is not alone young women who are vain, nor young men. The old and middle-aged furnish plenty of examples—how many, the photographer alone, of all men in the world, is best acquainted. Clever men, who have made their mark in science, in letters, in art—men whose names stand so high in the world that one might imagine them altogether above the small vanities of their fellows, prove, time after time, that not only do little things please little people, but big people as well.

We recal an example of this kind that struck us very forcibly some time ago. The late Mr. Crawshay, of Cyfarthfa, was, as everybody knows, a clever portraitist; indeed, his ability in this branch of the art was more than once recognised by a medal from the Photographic Society. His portraits were bold and forcible, and posed with much taste; moreover, they were not retouched, beyond the "spotting" that is always more or less necessary. A visitor rarely came to the Castle without sitting to Mr. Crawshay, and on one occasion he had as guest a noted officer of one of the great London hospitals, a man a little past the prime of life. In his particular sphere this gentleman was second to none, and his name was as a household word in his profession. He sat to Mr. Crawshay, and the latter succeeded in securing what most of the visitors at the Castle pronounced a good likeness. The sitter accepted a copy on his departure, but next day came a letter to Cyfarthfa entreating that no further prints be struck off; he would send down half a dozen copies of another portrait, and begged acceptance of them. We had an opportunity of comparing the two pictures. Mr. Crawshay's portrait was that of a man approaching fifty—the features firm and set, the hair and whiskers streaked with grey; the other portrait was a little brown vignette, the features smooth and delicate, the whiskers soft and slight, the hair brown and luxuriant. The last was a well-pencilled likeness taken ten years before, and the model had evidently made up his mind that no other should ever be issued of him—he would never be so young again. Mr. Crawshay, out of deference, destroyed his negative, so that no copies could possibly get abroad: but scarcely had he done so, than his former guest died, and bitter was the disappointment of friends and relatives to find no recent portrait of the great man in existence.

It is pretty evident, then, that a photographer who wishes to live by taking portraits must employ the retouching pencil. The young American lady who lacked beauty, and whose frank avowal was, "I mayn't be pretty, but mother says I've got the intellects in me," has few counterparts in this country; rather it would seem that those who have least cause are the most vain. Mr. Simon Tappertit was, according to impartial evidence, not an Adonis, and yet he spent most of his spare moments before the looking-glass, examining into the exact state of a pimple upon his nose. Most of us in this world have pimples of some sort or another—not always on the nose—that we are very anxious about, and if the photographer can only discover at the outset what is the peculiar weakness of his patron, he will be already half-way towards pleasing him For whatever the size or nature of the pimple, we prefer to have it as inconspicuous as possible in our portraits. In most cases we suspect it is the matter of age that has to be got over, and a difficult matter it is, too. Thus the avoidance of top light, for instance, is an important essential, for if this does not exaggerate a tendency to baldness, it frequently has the result of making a parting more visible. The recesses of the eyes and the prominence of the cheek-bone are also obstacles to which the photographer must pay particular attention, if he does not desire the pictures thrown back upon his hands. In fact, much retouching is rendered unnecessary if the photographer thoroughly understands lighting his model, for just as heavy shadows falling in unpleasant places seem to add years to a sitter's life, so skilful illumination may impart both youth and freshness to a portrait.

We have said that in the opinion of good judges, the public will not be satisfied with a just and true portrait. We do not propose to discuss the dictum, but we think it is very likely to be true. At the same time, the photographer must remember that, if the public are not fair towards him, he is sometimes unfair towards the public. There is such a thing as producing a portrait that represents the sitter older than he or she is; we will go even farther, and say that the unskilled usually produce portraits of this kind. This is the reason why retouching is so frequently resorted to. The pencil is employed to compensate for bad photography, and in these circumstances the work of the retoucher is unjustified. It is this, more especially, that tends to bring retouching into disrepute.

In conclusion, we would remind our readers not only that they live in *Vanity Fair*, but to be successful as portraitists, they must study to purvey such articles as are in request at that fair. In doing so, there is no need to degrade art, and they will do wisely and well who "o'erstep not the modesty of nature."

The "At Home" next week will be "Mr. H. Wilmer at the Great Eastern Railway"; the following "By-the-Bye" will be "Articles de Paris."

Notes.

Fiji and Spain have both won places of honour at the Melbourne Exhibition, and, according to the Prize List which we published last week, photographers in Australia, India, and New Zealand, are quite competent to hold their own with those of the old country. "The First Order of Merit" included as many Colonial exhibitors as European.

"Chemical Affinity" was the text of Dr. Helmholz' Faraday lecture at the Royal Institution on Tuesday. The force of gravitation, powerful though it might be, was insignificance itself compared to that mighty energy which kept two sympathising atoms together. Oxygen might be separated from hydrogen without much difficulty, but to rend asunder two atoms of hydrogen necessitated a force that was almost too great for human understanding. It was to this incalculable power of "chemical affinity," upon which Faraday laid so much stress in his life-time, that Dr. Helmholz pointed as the investigation of the future.

On Wednesday evening, Dr. Helmholz was entertained at dinner by the Fellows of the Chemical Society. Sir William Thompson, who was also one of the guests, happily illustrated the force of "chemical affinity," by stating he held it to be some seven million times greater than that of gravitation.

"Silver Printing," the new work by Mr. H. P. Robinson and Captain Abney, F.R.S., is to appear early in May. The frontispiece will be "When the day's work is done," the picture of Mr. Robinson's that secured the gold medal at the last Paris International Exhibition, and we are promised, moreover, a chapter describing the elaboration of that now famous composition.

A rumour is abroad that the recent notification in the *London Gazette* relative to the retirement of Captain Abney from the Royal Engineers will be cancelled. In that case we shall have the pleasure of congratulating the gallant photographer on his promotion to field rank within the next twelvemonth.

April, 1881, will be a significant date in the annals of street lighting, for the City of London will never give up electricity again, now it has been so generally adopted We read in the *Standard* that the electric light in King William Street so overpowered the gas "that a shadow of photographic intensity" of the gaslamp was thrown on the roadway. What is "a shadow of photographic intensity?"

Going home the other night with his detective camera, Mr. Bolas, we hear, secured a photograph of Charing Cross station lit up by the electric light.

Sir William Armstrong has had his picture gallery at Cragside illuminated with the Swan's electric lamp, an experiment proving, apparently, that the incandescent carbon of Mr. Swan, which is free from the violet glow of other electric lights, is the only system that can be used to illuminate pictures with advantage. The Paris *Salon*, lit up with electricity last year, was a very unsatisfactory experiment; but in Sir W. Armstrong's gallery, we are told, the qualities of the pictures, especially Mr. Millais' "Chill October," and a glorious red sunset by Mr. Vicat Cole, in no way suffer by the novel method of lighting.

It is not generally known, by the way, that Mr. Vicat Cole, distinguished landscape painter and Royal Academician though he be, is not ashamed to be seen behind the camera occasionally, and is, indeed, an accomplished photographer.

According to the *Journal of St. Petersburg*, the mine discovered after the Czar's death in one of the streets of the capital contained nitro-glycerine and a certain amount of gun-cotton in solution. This has led to the conclusion that it must have been collodion that was used, and collodion would naturally suggest the possible connection of a photographer or surgeon with the assassination of the late Emperor. But gun-cotton dissolved in ether and alcohol, explosive as it may be under certain conditions, is not nearly so dangerous as pyroxylin contained in another solvent, to wit: nitro-glycerine. This liquid, which is obtained by the nitrification of glycerine—by dropping glycerine into nitric acid—in the same way as gun-cotton is obtained by the nitrification of cotton, will dissolve as much as eight or ten per cent. of gun-cotton, so that we have here the case of one explosive being dissolved in another explosive. It was with this terrible compound that the mine in St. Petersburgh was filled.

Our readers may remember that some time ago an account appeared in these columns of an attempt we made to employ pyroxyline dissolved in nitro-glycerine in photography in place of collodion. A gelatinous film is formed on the glass plate—indeed, the composition is known as "blasting gelatine," albeit there is not a particle of gelatine in its composition—but the film did not dry quickly, and it failed to carry as much of the sensitive salts as collodion. Moreover, it had the drawback of producing a violent headache upon any one who merely touched the film with the finger. Blasting gelatine is the most terrible, as it is the most recent, of all stable explosives.

Said an experienced printer to us the other day :—"The main point of difference between silver and carbon printing is that of selection : from a dozen silver prints you may pick six good ones ; from a dozen in carbon, only two or three. Selection has much to do also with the status of a studio ; a high class firm prints twenty copies in order to select half a dozen fine pictures, while a firm that charges very low prices cannot afford to throw prints away at all, and therefore issues every one printed. Out of a hundred impressions there are never two alike ; there is always a best, a next-best, and so on."

Another Society of Chemists—the fourth—was founded on Monday last, Professor Roscoe being chosen the first president. "Chemical Engineers" was the name originally suggested for its members, but we believe the gathering is now to be called the Society of Chemical Industries, or something of the sort. The Vice-Presidents and the Council have already elected themselves, and now there only remains to get the members.

"What do you do in your Society?" we remember a gentleman asking some time ago, when importuned to become a member. "Well, in the first place, don't you know, you pay two guineas a year"—"Ah!" interrupted the other, "then in that case, I don't think I shall belong."

The facility which photography offers of depicting a scale in feet or inches, cutting *through* or bisecting the object depicted, is a quality likely to find useful application in science. Last week, in discussing the aid that photography lends to the study of anthropology, we showed how the measurement of a skull might be easily determined by photographing, first of all, a black and white scale against a background of black velvet, and then, without altering the focus of the lens, securing a second picture upon the same plate, of the skull, which is suitably adjusted in position, in place of the scale.

By the same plan, the diameter of most solid objects, no matter what their form, may be measured without difficulty. It only rests with the photographer to say what particular section, or rather imaginary section, he desires to measure, and then he must take care, when he substitutes the scale for the object, that the section in question is in the same plane as that occupied by the scale that he has withdrawn. Of course, camera and object-stand must be levelled with accuracy ; but even if the object is not represented with absolute truth, it must be remembered that the image of the scale exhibits corresponding defects.

Topics of the Day.

A NEW METHOD OF BACKING PLATES.

BY DR. HERMANN FOL,

Professor at the Geneva University.

I NEED not insist upon the necessity of backing sensitive plates in order to avoid that most unpleasant appearance which is known as "blurring." The phenomenon in question is well known, and different methods of preventing it have been recommended from time to time; and yet, if you look through any considerable number of modern photographs, you will be sure to find several otherwise fine pictures quite disfigured by it. This is most prominently the case with photographs taken by the microscope. Setting aside other defects which often make such pictures almost worthless for the student of science, a mere inspection of the very best of them will show at once that backing is sorely neglected by those to whom such a precaution is most needful. This neglect I ascribe to the difficulty of carrying out most of the methods hitherto proposed.

A very good plan was lately advocated in these columns ; it consists in painting over the back of the plate with black varnish. Now this is all very well for dry plates ; but such plates can seldom be used in microscopic work, on account of their granular texture. Moreover, how are we to look at the back of the plate during development? If you wish to do so, you must scrape down the varnish in the dark-room, and I, for one, strongly object to any additional performance in that dark place beyond what is strictly needed for developing.

But let us enquire first into the conditions to be fulfilled by an effective backing, and then let us see whether these conditions cannot be attained in some easier way. A very simple experiment will show at once the right path. Take a common thick drinking-glass, and hold it to the light so that the image of the luminous source is reflected from the side of the glass. One image is very bright ; this arises through reflection on the outer surface, and need not be considered any further. A second, and much paler reflection, from the inner surface of the glass will next attract attention ; this it is which works the mischief, and must be abolished. Now fill the glass with water, and this second image will grow much fainter; replace the water by glycerine or any other strongly refracting medium, and the image will disappear altogether. If the glass be filled with some dry pigment—lampblack, for instance—or lined with black paper, the reflection on the inner surface will be visible just the same as if the glass were empty. Now we at once perceive why the most commonly-adopted plan of backing a negative with brown water-colour or with black paper is most ineffective.

The back of the plate ought to be coated with a strongly-refracting medium mixed up with a substance capable of absorbing the chemical rays of light, and this coating ought to be easily put on and taken off, either on dry or on wet plates.

My plan is simply this. Whilst developing carbon prints, I lay the tissue, as soon as it comes out of the warm water, flat down upon a waxed plate, and make it adhere everywhere. After a few minutes the gelatine is set with a flat even surface. I take it from the plate and lay it in a dish with common glycerine, where it is allowed to soak for twenty-four hours. It is then taken out, any superfluous glycerine is removed with the squeegee, and the leaves are stored up in a tin box ready for use. The tissue paper and the gelatine are sometimes rather too thin. It is, therefore, more advisable to prepare a sort of chromographic paste purposely, with gelatine, glycerine, and a very small addition of treacle and Indian ink, instead of baryta. It is also well to add some sort of non-communicative red colour, such as alizarine. Strong paper, or even black shirting, coated with this mixture and laid down to set, face downwards, upon a waxed plate, will yield the best backing sheets.

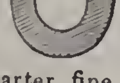
Before putting the sensitive plate into the frame, one need only apply one of these sheets on the back, and press it down so as to expel any interposed air-bubbles. This will be found to succeed most easily if the glue mixture has the proper consistency. After exposure, the backing is stripped off in the easiest manner, and will serve again and again for weeks and for months. Care must of course be taken to prevent the spring from injuring the gelatine film. This is best effected by interposing a piece of thin card-board between the spring and the tissue.

I hope that with such an easy plan, suitable either for wet or for dry plate work, blurring will soon be reckoned amongst things of the past.

The "Topic" next week will be "On the Formation of a Chemical Compound of Ammonia with Silver Bromide," by J. Vincent Elsden, B.Sc. (London), F.C.S.

GLAZING STUDIOS WITHOUT PUTTY.

BY J. C. STEPHENS.

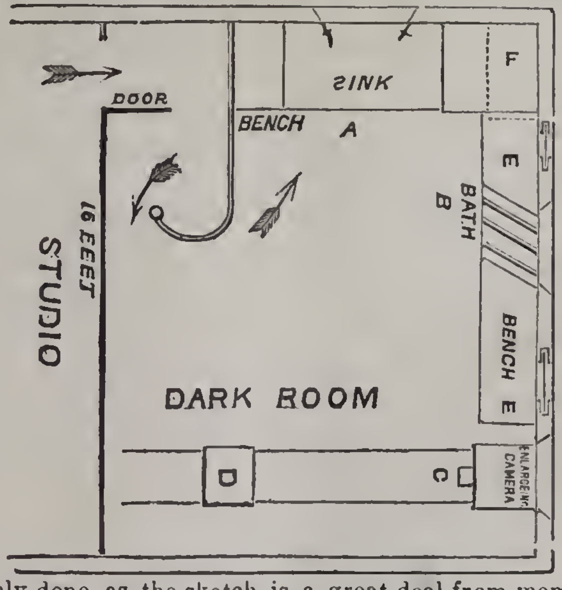
So much has appeared in the photographic journals on the form, &c., of studios, that it would almost appear nothing more could be said with advantage; but it is an eyesore to see the amount of wood (useless, in fact a great part detrimental) in the construction of most, if not all. I propose, therefore, to abandon the use of wood in the bearings for the glass, and substitute half-inch rod iron; these bars to be in one length from the top of the roof to the bottom of the side to be swaged out, as this section  series of holes to admit one inch or inch-and-quarter fine screws, to be made fifteen or sixteen inches apart, counter-sunk on the under side, and then bent to the required angle of the roof and sides, provision, of course, being made at the ends for fastening. The rods being set up and fastened, a strip of fine felt, half-an-inch wide, is fastened on them, from top to bottom; along the centre of the felt strip, from the under side, is placed a series of those little fasteners used for connecting loose papers together. The panes of glass are then laid on, edge to edge, on the sides, and the ends not to lap more than one-quarter of an inch, a narrow strip of calico, previously payed over on both sides with white lead of moderate consistence, to be placed over the joining of the edges, and the fastener having been made to come through, is bent down one on each pane, the final operation being to put over all a narrow triangular slip of wood (the base zigzagged to meet the laps of the glass), fine screws up through the iron rod being used for the purpose of binding the whole together. I think I can claim for this method easiness of construction, considerably less amount of opaque breaks in the light, and perfect freedom from leakage. It should be noted that the felt is an important feature; it not only forms a soft bed for the edge of the glass to lie upon, but it checks the tendency of the iron to contract or expand from changes of temperature. In order to give stability, a bar of iron a quarter-inch thick and one inch wide, with hollows on the edge to receive the sash bars, may be fastened in the angle of roof and side, while another may be placed halfway in the length of the roof, both being placed at such an angle as to intercept the least light. The glass at the angle may either be bent to shape, or the lower roof pane, and the upper side light pane, may meet edge to edge; in the latter case the edges should be anointed with Canada balsam.

Dunedin, New Zealand.

MY DARK-ROOM.

BY MARSHALL WANE.

In giving this short account of my dark-room, I quite expect there are others who may have something similar; but, at the risk of treading on the corns of those who have, I give the particulars of mine for the benefit of those who have not. I am quite aware that every photographer would not be able to adopt this plan; but, for those who can adopt it, I consider it the perfection of a dark-room, as you can go in and out of the room while a plate is being developed or prepared, and the door wide open (as shown in sketch enclosed). That is for wet plates; but for enlarging on dry plates the door must be closed. I give a ground sketch, ¼ inch to the foot, somewhat roughly done, as the sketch is a great deal from memory, the dark-room being in the Isle of Man. The arrows show the mode of entrance from studio into dark-room by the door, which is open, and is kept open with a small bolt into floor, if required. The partition, with curved part, is all covered on the top, just the height of door-frame to the front of door, thus shutting out all light from the entrance. The developing tank, A, and window, face the north; the baths—three of them—are at the window, B, facing the east; and at C you have a window for



enlarging. A camera is fixed there permanently, with a tramway of angle iron on the floor, on which runs a square, strong table, D; on one end of this is fixed an upright sliding frame to carry the opal plates, wet or dry, or any other plates used for enlarging. The whole arrangement is so simple, that it is a positive luxury to work it, and is always in its place, and never removed for any other purpose; and, as a consequence, an enlargement can be made at a moment's notice. The room is 16 feet by 12, and is ventilated by the skirting-board just above A. At E a brick is left out and a slate inserted upright in the centre of wall (as shown in sketch). Fresh air comes in without light, and the foul air goes out at the top of roof. There is a cistern made of slate inside the room, at F, close up to the ceiling. I have a table in centre of room, not shown, which is useful for negative rack, &c. You will thus see that the comfort and convenience of assistant and myself are provided for, with plenty of room to move about. Everything is in its place, and can always be found; no fumbling about, and no temper soured by things getting astray; consequently, no swearing or discontent.

TOUCHING AND RETOUCHING.

BY M. P. B.

A great deal has been written and said for and against the practice of negative retouching; but I think, to an unprejudiced mind, a judiciously and artistically-retouched negative cannot fail to assert its own superiority over an untouched one, as the latter so greatly exaggerates all skin defects. In saying this, I hope no one will take up the idea that I mean those hard, marble, death-like productions that one sometimes sees, with all life and character worked out of the face. I think this just as reprehensible as the other is commendable. I saw a photograph of a young lady the other day (and a good-looking girl she was, too), a full-face vignette, and it had been retouched by a "professional retoucher." The treatment of this negative was such as to make the young lady look perfectly plain. The nose, by working on the end, was made to appear "turned up." I can understand trying to make a "turned-up" nose look straighter by straightening the line a little, and I think most people possessing such noses would be glad to give the artist so much licence; but to make a nice, thin, straight nose point upwards, seems too absurd. The check bones were also worked upon to such an extent, and made to look so high and prominent, and the light on the upper lip brought out so ridiculously high, which caused it to protrude, that the face looked more like that of a Zulu than a pretty English girl. The stippling was very fine, but the taste execrable. I am sure no one will disagree with me in saying that this is a great abuse of the art of retouching; and that this abuse is carried to a great extent, one may judge by the number of stony, unnatural, un-lifelike photographs one sees about, more like copies from some cast, than from the life; and yet some of these are offered as choice productions—works of art! A good cast is very beautiful as a cast, but let a photograph retain all the vigour, life, and character of the original. To remove freckles, soften hard lines and wrinkles, assist the delicate blending of lights and shadows. To do these, adds grace and refinement to a face (and all persons like to appear to the greatest advantage), is quite legitimate, and within the province of a negative retoucher.

I will not go into detail of retouching ordinary negatives, but will confine myself to the touching of prints; but sometimes negatives require more than ordinary retouching—at least, there are other uses to which it can be applied besides the face.

I have lying by me a photograph of an elderly white-haired gentleman taken by one of our eminent photographers, and I see that the hair (and he has a good deal) had been too much flattened at the back of the head, which spoiled its contour. This has been deftly supplied by the pencil on the negative, and none but a practised eye could discover that it was artificial. Being white hair, this would not be a very difficult matter; but had the hair, been black it would not have been so easily accomplished. A few lights might have been put in, and the rest would have to be done on the print. I myself have been engaged this week in retouching the negative of a gentleman dressed in the fancy costume of a Chinaman. This gentleman has black hair, whiskers, and moustache; and, as it was necessary for the character he had assumed to show a shaven head and whiskerless face, they had to be powdered before taking the negative (I suppose he would be obliged to be content with powdering them for the ball). The negative now showed the profile of a gentleman with white whiskers; there was not much of the hair visible, as he wore a kind of hat which came down at the back to the top of the pig-tail. In retouching it, I took out all the shadows in the hair, and from it, and also the end of the moustache (this that I might be able to turn it down in the print, as is the habit of the Chinese to wear them), and brought those parts to the density of a shaven head and cheek. I have to-day been touching up the print; there was the faintest indication of a whisker (any one not knowing would think it one of those incidental defects which cannot always be avoided), and this, with a little colour, I very easily effaced, so that now the illusion is complete. This shows what may be effected with a little dodging. Shadows and half-tones may be worked up in the negative, but the too strong high lights can only be reduced in the print, so that the touching and retouching are only complete when the print is finished. If the high lights are generally too strong, they can easily be softened by exposing the print to the light for a second after it has been taken out of the frame; but this would not do for small or particular patches of light: they must be rounded and softened in the touching-up of the print.

On the touching of prints, I may, perhaps, be able to give a few hints to the uninitiated. It is a very important branch of the profession when done dexterously, for what cannot be done in the negative may be effected in the resulting positive. Let the photographer be as careful as he may in taking the negative, lighting, retouching, or printing it, there is always something for the finisher to do in order to show a perfect whole.

The things requisite are a small sable brush, a small porcelain palette, a cake of india-ink, a small cake of carmine or lake-red, one of prussian-blue, a box of powdered gum, and a small sponge. These colours should be kept exclusively for this purpose, as in using them together one gets contaminated with the other. First dip the end of your india-ink into water and rub on the palette, then add a little of the carmine, and if the prints to be touched are of a brownish tone, these two colours will be sufficient; but if they are more of a grey, a little of the prussian-blue may be added. To this add a little gum. This is necessary, in so far that it prevents the touching from rubbing off so easily as it otherwise would do, and it also gives brightness or gloss to the colour, making the work not so easily discernible on the photograph. You have now got your colour mixed to the tone of the photographs, only it must be a great deal darker; but be careful not to have it too thin. Squeeze your sponge out of water so that you may rub the point of your brush upon it when too dry, and when dipping it into the water would make it too wet. It is an important point not to have too much colour and moisture in your brush; have quite sufficient to be able to make an impression on the print with it, and in all cases use only the tip of the brush. If the mark to be obliterated is a very small spot, one touch with the tip of the brush will be sufficient. Sometimes, by touching the particles of pigment left on the spot with the tip of a finger, it can best be diffused. It is difficult to describe intelligibly all the minute working that is sometimes required, as by practice the hand acquires a certain cunning which only practice can give, and which cannot be conveyed in writing. By patient labour and persevering, all difficulties may be overcome, and this applies to touching and retouching, as to other things.

◆

ON PAPER NEGATIVES BY THE GELATINO-BROMIDE PROCESS.

BY H. J. PALMER.*

I think it will be conceded that we workers in the gelatine process are greatly indebted to Messrs. W. T. Morgan and Co. for taking the initiative in the production of paper coated with a sensitive film of gelatine; and there seems to be every probability that the commercial enterprise of those gentlemen and others will eventually work a revolution in those departments of photographic art—of printing and enlarging—in which paper has hitherto reigned supreme.

But it seems to me that we amateurs ought not to rest content until we, too—as we have, one by one, fought out and conquered the obstacles which beset us in the production of negatives on glass—have conquered the difficulties of this branch of the gelatine process also; and I am glad to see that I have been anticipated in my efforts in this direction by a valuable paper by Mr. W. T. Wilkinson.

From the instructions given by Mr. Wilkinson it would seem the process of coating a sheet of paper with gelatine emulsion is one of exceeding simplicity. It is merely necessary to float the paper upon the emulsion, as in sensitising with silver, and then to dry in any convenient way. The results producible from paper prepared in this way are extremely satisfactory, and enlargements can be made by an amateur with an apparatus of the simplest character which may compare most favourably with the best work of professional artists. I will merely add here the suggestion that both for enlargements and for ordinary printing the most satisfactory developer is the old form of ferrous oxalate as supplied by Messrs. Mawson and Swan, in which the iron employed is the ferrous oxalate, and not the cheaper sulphate.

But the question which I wish to bring before you to-night does not refer to the production of a gelatino-bromide paper for positive pictures, for which a comparatively thin film suffices; but is, rather, this—Cannot paper be once more used with advantage for negative work in the field? Most of us can remember with pleasure the very beautiful results with which the patient practice of the calotype process was wont, in days long gone by, to reward its devotees; but then the intolerable length of the necessary exposure was an insurmountable drawback, and on the introduction of collodion the calotype picture became a thing of the past. Gelatino-bromide, however, supplies us with a new point of departure in the art of the production of paper negatives; and the object of my remarks this evening is to suggest its application to paper as among the "fresh fields and pastures new" which lie before workers in gelatine.

First of all, a good negative will require a thicker film than the floating method can give us. I pass round some paper negatives, with prints from them, taken upon Messrs. Morgan and Co.'s paper, to show that this is the case; and it would seem that to secure this thickness of film we are limited in our mode of procedure to one which will enable the paper, with its film of emulsion, to lie perfectly flat until the gelatine has set. Now, this is a matter which has puzzled me much. I have, I think, however, mastered the difficulty by having recourse to an old ally, which I called to my aid, in the use of my sensitive gelatines in the dark slide. I mean glass plates coated with films of gelatine to which, while in solution, a proportion of treacle had been added. This proposal may possibly be suggestive of a "mess" to some minds; but I think that the plates prepared in this way which I now pass round will prove that there is no real ground for the objection. A slight amount of moisture applied to a dried film of this nature renders it very tenacious of anything with which it comes in contact, and the amount of tenacity depends, of course, upon the proportion of the treacle to the gelatine. After many experiments I have ascertained that the addition of treacle in the proportion of one in six will give about the amount of tackiness required.

A plate, then, of the requisite size is coated with this mixture, is accurately levelled and dried, and is then ready for use again and again. It is only necessary to breathe upon the whole of its surface, to place the paper to be sensitised upon a soft, flat pad, and to bring the film down upon it with a moderate and even pressure. It may now be coated with emulsion to the requisite thickness, be placed on the level, and when the film has set it may be removed and dried in the drying cupboard. I will now proceed to coat a sheet of paper in this way, to show you how readily the process can be performed.

It is necessary to use waxed paper, or *papier mineral*—because, in the first place, if ordinary paper be used, the surface wetted by the emulsion would adhere permanently to the film below; and, in the next place, obviously the more transparent the paper is rendered, the less will its grain and water-marking interfere with the detail in the shadows of the prints which are taken from the paper negative. For convenience of exposure in the camera the treacled films will once again be employed. Each slide should contain a glass plate prepared in this way, and then, before setting out for the day's work in the field, the sensitive papers are affixed to the supporting glass and exposed upon the subject with all the evenness and flatness of an ordinary plate. It is unnecessary to add any remarks on the subject of development, save that pyrogallic acid must be avoided on account of its tendency to stain paper.

My reason for bringing this matter before you is not derived from the fact that the process is one which has been perfected in all its details, but rather from my desire that other amateurs with more leisure and greater skill than myself may have their attention once more directed to the production of paper negatives, and thus that we may be relieved from the many disadvantages which (*pace* Mr. J. A. Forrest) attend the employment of our, in many respects, useful old friend—the glass plate.

◆

THE PORTABLE STEREOSCOPE AND PANORAMIC SLIDE.

BY W. HARDING WARNER.*

In introducing to your notice this evening a new form of stereoscope and slide, it is with the object of inducing those who now take single pictures in perfection to enjoy in a higher degree the images they now depict, and, at the same time, convey to others a like pleasure.

The old style of instrument (Brewster's refracting stereoscope) is so well known to you all that I need hardly enter into a minute description of it, only so far as to show the difference between that and a few others and the present portable instrument now before you.

You will recollect that in the old form of stereoscope the picture was of small size, entirely enclosed except an aperture on the top, to which a flap with a mirror was attached, which, when placed at a proper angle, conveyed light to the pictures. The achromatic lenses were contained in brass tubes which moved in and out, and so enabled an accurate focus to be obtained. Messrs. Smith and Beck, opticians, of London, introduced, as a modification, a rack-work between the two, which enabled them to be divided and adjusted to different sights. The more common form, however, had only the outer section of a large double convex lens, cut off and then divided, the two thin ends being placed together sometimes with, sometimes without, a division as eyepieces. The ends of these meeting on the top of the fixed nose-piece or division inside the instrument, the necessary angle was given through which the eyes of the spectator viewed objects as apparently solid and real.

There was also another form introduced by Mr. F. Stanley, optician, of Great Turnstile, Holborn, London, which consisted of a thin table of mahogany, on the bottom of which was screwed a handle, and on the top, at one end, were fixed a pair of double convex lenses as eyepieces, with a fixed nose-piece, while the picture ran in a groove opposite. The whole affair cost but half-a crown, I think; but it answered the purpose admirably.

The stereoscope introduced by Mr. Robert Murray, of the firm of Murray and Heath, opticians, Jermyn Street, London, in 1868, took the form of Brewster's instrument, extended, to meet the longer focal length of lenses necessary to view the larger form of pictures, being closed at the sides and back with perforated woodwork, and open in front, the bridge for the nose extending from the top to nearly the bottom of the instrument. It was a very elegant production, and much pains and care were bestowed upon it. There was another form in metal, open on all sides.

In all these instruments, you will notice there was no place or receptacle in which to keep the slides; they had to be carried separately, and the affair was bulky and inconvenient for carrying about.

---

* Read before the Liverpool Amateur Photographic Association.

In 1871 the portable stereoscope now before you was made from designs given by me to that well-known manufacturer, Mr. George Hare, of Calthorpe Street, London. It embraces all the advantages of former instruments, while it remedies their defects. You will observe it has every form of adjustment, and only needs a good light in which to view the pictures.

I now come to the more interesting part of my subject, the "panoramic slide"—so called because it embraces within its compass a large angle of view, and enables us to give views of objects wholly unattainable in the old style. Its discovery by me in 1863 was due to the introduction of the now-popular cabinet picture, in the desire to take two negatives on one plate, so as to facilitate the obtaining of copies with greater rapidity. I am led to hope, from the favourable way in which it has been received privately, that when it becomes generally known it will be quite as popular as its predecessors, while it will doubly conduce to the amusement and instruction of all, especially of the educated classes, as they will view the pictures so taken as seen in reality. There are a few points necessary to be observed in taking negatives for this stereoscope—as regards plates, lenses, and composition of subject.

First, as to plates. They must be what are termed "whole"—8½ by 6½ inches—in order to cut a clean 5¼ by 3 inch picture therefrom, the board on which they are mounted (when reversed) being 7⅛ by 6 inches. Larger pictures may be produced, but the same width must always be observed; and it will be found that, practically, a longer picture is useless, unless the lenses and size of the stereoscope be materially altered, and the expense proportionately increased.

Next, as to the lenses. The longer the focus at which they can be used the better and rounder will be the images produced. They may be of wide angle. For interiors and large masses of architecture, short-focussed lenses are necessary; but they should not be less than five and a quarter inches focal length, otherwise the objects look too diminutive, and the semblance of reality is lost.

In the composition of subjects, extra care is required in making up the foregrounds, so as to obtain a proper balance between that and the distance, or the height, as well as in the varied planes of space between objects in the middle of the picture, so as to ensure relative size and proportion. This is specially required when taking interiors, where height necessitates the counterbalance of a large pier or column to adequately convey the scene to the beholder. The same with trees as regards distant hills or mountains; a mast, as regards other parts of a vessel when working from the deck of a ship, &c., &c.—all of which you will find illustrated in the following slides:—1. "Tintern Abbey—Tomb of Founder." 2. "Cadets Aloft." 3. "H.M.S. Britannia." 4. "Hereford Cathedral—Arches in Choir." 5. Interior of Leominster Church." 6. "Kington—On the Road to Rhayader." 7. "Osmunda Regalis." 8. "The Stanner Rocks, Kington." These are all numbered from 1 to 8 on the slides.

The old plan of taking stereos. was to so arrange your subject that the eye, travelling all round, at length reached the centre, when it grasped the whole; yet you felt conscious all the time you were looking only at a picture because of the diminutiveness in the size of the objects viewed (see slide in old style to compare with slide 1 of same subject). In the new form, however, you lose this sensation; the extra height of picture exactly meets the capacity of the eye, and, while regarding this, becomes sensible of a depth of representation to gain which the lenses are lowered, when the whole appears as viewed in reality. When the eyepieces are comfortably adjusted, by lowering the instrument up or down at pleasure, the full effect bursts upon you, and again is realised the enjoyment you experienced when the negative was produced.

The best position for seeing them by night is with the light in front, the stereoscope being held sloping towards it; in the day time, sitting by a window in any position, so that a good light is thrown upon the subject.

These pictures may be taken from a height, looking down into a valley giving objects in its depth, and what may be seen on the opposite side or in the distance beyond higher still (see a slide, marked "defective," of "Ruthin Castle and Park from Llanfwrog Church").

Illustrations may be found in the following, numbered from 9 to 18 on the slides:—9. "Ivybridge from Woodon Bridge, Looking up the Erme." 10. "On the Yealm, near Plymouth." 11. "Hereford Cathedral—The Rood Screen." 12. "St. Saviour's Church, Dartmouth." 13. "Ivybridge—Rocky Pool on the Erme." 14. "Yatton Court, on the Sugg.' 15. "Ivybridge, above Weir Head, Looking Down." 16. "Dartmouth—Church of St. Petrocks." 17. "Ivybridge below Weir, Looking Down." 18. "St. Saviour's, Dartmouth—The Pulpit."

All the slides are by wet collodion, iron development with acetate of lead added. Intensified with silver; no pyro. *Apropos* of these slides, I beg to apologise for their antiquated and soiled condition; but they are all I have left out of a great number taken many years ago. The date, lens, and exposure will be found on the back of each. The negatives are nearly all of them destroyed—they are the original prints.

A few words on the printing of negatives for this stereoscope, with the making and printing-in of clouds, will not be deemed out of place. One of the causes that led to the decline of the old stereoscope was the injury caused to the sight by the use of highly-glazed paper. The lenses used, having a high magnifying power, combined with the light reflected from the glaze of the paper, fatigued the eye from the constant glare. You will notice that the slides, though on albumenized paper, are almost matt. One is on highly-glazed paper, and fatigues the eye by the glare. When we acquire proficiency in platinotype printing, then we shall be able to revel in the stereoscope.

As to clouds and the putting-in of them into stereoscopic landscapes: this can only be properly effected by negatives taken expressly for the purpose, or by making stereoscopic negatives from single-cloud negatives in a copying-camera. Having done this on the same sized plate as your subject negative is taken on, print a copy of this latter to use as a mask when printing from the cloud negative in the usual way, so as to obtain a proper register, care being taken to sun-down or soften the line of junction. It may be objected that clouds so taken could not be stereoscopic; but it must be borne in mind that they are always at a long distance from us; therefore, the different planes are not really discernible, while we obtain the facility of having the double negative for printing into many subjects.

To use this stereoscope for transparencies it must be closed in on the top and two sides. This may be effected in a temporary way by anyone, a small space being left for the slide to go in on the top, and a groove down each side to hold it firmly in conjunction with the bottom would make it perfectly safe. A margin should be printed up the two sides to improve the effect. I have not attempted to add this at present, as it would very much increase the cost of the instrument.

I find I have omitted to mention the piece of metal called the "nose piece" or "bridge," described in the prospectus "to accommodate all sights," or, rather, all sorts of noses. As a rule, you do not need to put your eyes close to the glasses, and, after a little while, when accustomed to the instrument, you will find it may be entirely dispensed with.

Correspondence.

DEFECTS OF PORTRAIT LENSES.

Sir,—Will you allow me space in your paper for a few remarks in support of Mr. Sawyer's plea for the substitution, now that we do not require to strain every nerve to make up for the comparative insensitiveness of the collodion film, in place of the portrait lens, of some form in which every other good quality is not sacrificed to speed?

Let us see what these good qualities are. In the first place, we give up depth of focus. This is inevitable with a lens of large working aperture, whatever be its construction, and would be overcome by simply stopping down the lens; but another bad quality we have which no amount of stopping down can improve, and which arises from the large number of refracting, reflecting, and diffusing surfaces.

It is not generally considered that every refracting surface in a lens is always also, to a certain extent, a diffusing surface; that is to say, that all the rays do not follow the theoretical path, but a certain number of them are diffused in every direction from the surface of the glass. Nor is it generally realised that each surface is also a reflecting surface, and that it reflects back with a certain amount of brightness the image on the sensitive plate, the amount of light reflected by each surface being proportionate to its area. The consequence of all this is, that the camera is filled with a certain amount of diffused light, which is greater, the greater the number and size of the surfaces which the light has to pass through in its path.

The practical result is to be found in the fact known by every photographer, viz., that the latitude of exposure is less with the portrait lens, which has six surfaces of large size, than with a lens which has a smaller number. It is evident that the maximum exposure which can be given will be that which would not fog the plate by the action of the diffused light alone, and this is just barely enough to imprint on the sensitive film the detail in the shadows, and to give density in the high lights.

It is true that in the modern form of portrait combination the greater part of the reflected light is not, as it used to be, thrown on the central part of the plate, thereby producing the well-known "flare," and it is also, I believe, a fact that a portrait objective has recently been constructed in which the back pair of lenses are cemented together. Still the evil is but slightly mitigated, and we have other bad qualities in comparative curvature of field, want of marginal definition, and in quality of illumination, which will be in no way removed by cementing the back lenses together. Add to all this, that a picture taken with a large diameter lens consists, strictly speaking, of an indefinite number of pictures, taken from slightly different points of view, and superimposed, and I think it will be admitted that it is high time that we began to consider the adoption of some better form of objective. The question is, which, of the many that are offered us by opticians.

You printed six months ago a letter of mine in which I advocated the use of a single lens for portraiture, and in which I mentioned that I had enlarged the working aperture of such a lens to $\frac{f}{12}$, and still found that it gave good definition within the comparatively narrow angle which is permissible in portraiture. The focus of the lens was fourteen inches, and it still covered a whole-plate In a well-lighted studio, and with a rapid gelatine plate, the exposure in fine weather was not over from two to five seconds, while the quality of image was greatly superior to one obtained by a portrait combination of the same focal length stopped down to the same aperture. Few photographers would believe what they could do with such a lens till they had tried.

It seems likely, however, that the best combination would be that known by such names as "rapid rectilinear," "rapid symmetrical," "planographic," "true view," &c.

In stating the ratio of aperture to focal length of this and the portrait lens, Mr. Sawyer has, if I mistake not, taken the back, instead of the equivalent focus. This is scarcely correct, as the ratio of back to equivalent focal length does not hold good for different lenses. A normal portrait combination may be taken as about $\frac{f}{4}$; a rapid rectilinear, which I have, has a maximum working aperture of about $\frac{f}{9}$; and I believe the lenses known as Ross' Universal and Dallmeyer's D work at $\frac{f}{6}$. Voigtländer makes an objective which, if it will do all that he says of it, must be a very remarkable one, and which works at about the same as the last mentioned. I have stated that a single lens may be worked at $\frac{f}{12}$; these would give relative speeds of $\frac{1}{16}$, $\frac{1}{81}$, $\frac{1}{36}$, and $\frac{1}{144}$, or, roughly speaking, would require relative exposures of 1, 5, 2¼, and 9. Even the slowest requiring a shorter exposure with a dry plate than the portrait lens would require with collodion, supposing the relative sensitiveness to be represented by 10 and 1.

I think that, when photographers come to fully appreciate these facts, they will discontinue the use of these portrait lenses, except for restless sitters or for extremely dull weather. Those who use them now with gelatine plates, I believe, scarcely ever use them full aperture, but stop them down until they are slower than any of the other lenses I have mentioned, although they thereby acquire none of their good qualities, except depth of focus alone. This applies generally when the larger sizes of portraits are to be done, and when it is out of the question to use an aperture of anything like $\frac{f}{4}$.—I am, sir, yours truly,

W. K. Burton.

Proceedings of Societies.

Bolton Photographic Society.

A meeting was held on the 3rd inst., Mr. Thomas Parkinson in the chair. It was resolved that the *soiree* be held during the last week in April.

Mr. Dalton (Hon. Sec.) exhibited one of Chadwick's instantaneous shutters, which met with the general approval of the members.

Mr. Tonge occupied the major portion of the evening with practical demonstrations of the manufacture of gelatine emulsion, and also developed a transparency printed upon one of his own plates.

Votes of thanks were passed to Messrs. Marion and Co. for their exhibit of Chadwick's shutter, and to Mr. Tonge.

Liverpool Amateur Photographic Association.

The monthly meeting of this Society was held at the Free Library, on Thursday, the 31st ult., Mr. W. H. Kirkby, President, in the chair.

The minutes of the previous meeting having been read and confirmed, the Honorary Secretary read a letter from Mr. W. H. Warner, asking the Society's opinion as to the mounting of prints by photographers for competitive exhibitions. The general feeling of the meeting seemed to be that, provided no regulation of an exhibition was violated, this should be left to the discretion of the exhibitors. After some discussion,

The President thought that the matter was one which hardly came within the province of the Society to decide.

Messrs. Birtles, Blanchard, and Rutter were unanimously elected members of the Association.

The Rev. H. J. Palmer, Secretary, brought forward a proposal for an excursion to Bwlch-y-Croes and the Falls of the Twrch in the Easter holidays; but it was thought better to defer an outing of the Association till a later period in the season. He (the Secretary) read a communication to the Society by Mr. W. H. Warner on "The Portable Stereoscope and Panoramic Slide" (see page 165).

Dr. Kenyon was much pleased with Mr. Warner's stereoscope, and hoped that the re-introduction of this subject would promote the revival of stereoscopic work.

The Chairman proposed a hearty vote of thanks to Mr. Warner for his communication.

The Rev. H. J. Palmer read a paper on "Paper Negatives by the Gelatino-Bromide Process" (see page 165). He illustrated his remarks by a successful demonstration of the process.

The Secretary called the attention of the members to the empty state of the Association's portrait album, and suggested that, at all events, past and present officers should contribute their portraits to be preserved among the archives of the Society. He (the Secretary) read to the meeting the rules of the artistic competitions of the South London Photographic Society.

Mr. J. H. T. Ellerbeck then made some suggestions for similar rules to be adopted by the Liverpool Amateur Photographic Association.

This subject was, after discussion, referred to the Council, and it was resolved that the rules drawn up by it should be laid before the members at the April meeting.

Mr. Corkhill complained of the difficulty he had experienced in mounting the Woodburytype presentation prints, and said that the Secretary of the Woodbury Company had been good enough to write to him on the subject. He recommended a solution of glue for the purpose.

Mr. B. **Boothroyd** exhibited one of Hunter and Sand's instantaneous shutters.

The meeting shortly after adjourned to the last Thursday in April.

PHOTOGRAPHIC CLUB.

At a meeting held on Wednesday last it was resolved that the following matters should be published for the benefit of the fraternity at large.

Mr. **Warnerke** found that a moderately strong solution of persulphate of iron is extremely effective in lowering the density of gelatino-bromide negatives or of silver prints. The metallic silver, being partially converted into silver sulphate, and this salt being fairly soluble in water, becomes removed from the film at the same time, or during the subsequent washing. One notable advantage of this over other methods depends on the circumstance that the gelatinous matter of the film is not attacked in any way; indeed, it becomes hardened under the influence of the iron salt. A demonstration of the action of the persulphate of iron on an over-exposed silver print was particularly striking, as details rapidly appeared in deeply-bronzed parts, while the fainter details only suffered to a very small extent.

A method of clearing fog from gelatino-bromide negatives, which is due to Mr **James Cowell**, of Brighton, was also brought under discussion, and was spoken of favourably by Mr **Williams** and Mr. B. J. **Edwards**, the former gentleman handing round a number of negatives illustrating the matter. After fixation and washing, the negative is introduced into a twenty-per-cent. solution of citric acid, or into a similar solution containing ten per cent. of alum in addition. The modified solution used by Mr. Edwards contains one ounce of citric acid and one-and-a half ounces of alum in ten ounces of water.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, April 12th, at the Gallery, 5a, Pall Mall, East (the summer exhibition of the Water Colour Society being on view), when papers will be read by Mr. W. Dillworth Howard, on "Notes of a Swiss Tour with Gelatine Plates;" by Mr. H. B. Berkeley, on "Art and Photography—Suggestions for bringing them into Closer Connection;" and by Capt. Abney, R.E., F.R.S., on "The Natural Camera."

The Teignmouth Promenade Carte.—Mr. A. D. Lewis, of Newcastle-upon-Tyne, sends us half-a-dozen little portraits in shape something like an elongated carte-de-visite, and which he terms promenade cartes. The portraits are excellent in themselves, and, being upon black mounts and highly finished, they have a very natty appearance. Mr. Lewis forwarded us both bust and three-quarter portraits, but the "cut-off" appearance of the latter makes them less effective than the others.

To Correspondents.

*** Correspondents and Advertisers are reminded that next week, by reason of **Good Friday**, the **News** will be published on Thursday.

M. Little.—Some diversity of opinion exists as regards this point, but the general consensus appears to be in favour of white glass. It is, however, just possible that the blue glass may produce greater rapidity of action in the case of certain sensitive surfaces; this being due to the fact that yellow and red rays sometimes tend towards a reversal of the action of light.

J. S. Mumford.—1. Very little when in the presence of any soluble chloride. 2. A double proportion of acetic acid would not make so much difference as you suppose, and in your case will probably be about right. 3. At a temperature of about 230° Centigrade.

Calx.—Expose it to a red heat for about three hours, keeping the crucible loosely covered.

H. P. Smith.—A special hydraulic press is generally made use of the platen being small in proportion to the diameter of cylinder, and the extent of the rise being very limited.

Dutchman.—No process is known at present which will entirely satisfy all the conditions which you specify. The collotypic process appears to us to be nearest, but its successful working involves a considerable amount of experience beyond the range of ordinary photographic work.

K. L. T. (Bangor).—1. It is impossible for us to conjecture unless we see the negative, or at least a print from it. 2. Why not enquire from the person you mention?

Waiter.—Dissolve fifteen grains of iodine and twenty grains of potassium iodide in one ounce of water, and apply this liquid at intervals until the stains become light yellow in colour. Afterwards treat with one part of potassium cyanide dissolved in twenty parts of water. Extreme care should be taken that the cyanide does not come in contact with any cuts and sore places; and after its use the hands should be well washed.

S. Mimton.—Other things remaining the same, we should have expected the first mentioned lens to be the more rapid one.

A Little Photo.—A very excellent method is to coat with such mixture as the following:—

Albumen	1 ounce
Water	20 ounces
Ammonia solution	1 dram
Potassium bichromate	5 grains

We intend to devote a leader to the matter shortly.

J. B. Lewis.—The case is far too complex for us to be able to judge, and we fear that your only course will be to take legal advice.

L. H.—An iron developer is more suitable in your case, but the pyrogallic acid possesses no specific action in the direction you indicate.

N. Y. Gates.—1. No doubt any ironmonger in your neighbourhood can obtain it through his London agent—we believe that three pounds are sold for sixpence. 2. It is first prepared with an alkaline solution of shellac, in order to prevent the gelatine penetrating; and after this it is sponged over with a weak gelatinous solution, which serves to overcome the repulsive action which lac exerts towards aqueous liquids. Careful and thorough rolling is necessary in order to make the thickness uniform. You can send us further queries until full details are published.

M. Mitchinson.—Your acids were not sufficiently strong; try the effect of adding one fourth less water, and if the cotton again dissolves, reduce the quantity still further.

P. R.—In the laboratory it is usually weighed as chloride, this being heated until incipient fusion takes place.

In the Dark.—For such a purpose the light from burning magnesium will be found very convenient. Solomon manufactures a convenient lamp or regulator for use with magnesium wire.

Old Subscriber.—An article on the subject will appear shortly.

Argentiferous.—Dangerously explosive bodies may be formed under the circumstances; you will therefore do well not to employ ammonia for the purpose.

Matherson.—1. Albumenise your plates before coating with emulsion. 2. Full information in recent numbers of the **News**, and in our **Year-Book**.

Student.—Those who are most successful in the ruling of gratings keep their methods secret; but there can be no doubt that the apparatus used is similar in construction to the ordinary planing machine, a fine diamond point forming the tool.

L. Canton.—The instrument consists of a wedge-shaped piece of light yellow glass graduated on one side from 1 to 9. A piece of sensitive paper being pressed into contact with the graduated side, the light is allowed to shine on it through the yellow prism for a definite period, say three minutes; and the number impressed on the paper indicates the actinic intensity of the light.

M. B. G.—1. You will have no chance of success excepting during extremely bright weather, and even then it may be necessary to make use of a portrait lens working with a full aperture. 2. Not too great an excess, say about one-tenth more than the theoretical quantity 3. You can but try the experiment.

PATENTS

Compiled specially for the Photographic News, *by* Messrs. Des Vœux *and* Colton, *Patent Trade Marks and Photographic Copyright Office*, 32, *Southampton Buildings, Chancery Lane, London.*

Nicholas Schnorrenberg, of Bishopsgate Street, London, "An Improved Process or Method of Printing and Colouring Photographs on Glass." A communication to him from abroad by William Grune, of Berlin, Prussia.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1180.—*April* 14, 1881.

CONTENTS.

PAGE
Lohse's Method of Preparing Emulsion 169
The Economy of Silver 169
Photography In and Out of the Studio 170
At Home—Mr. Horace Wilmer at the Great Eastern Railway 171
Gelatine Transparencies for the Lantern. By Thomas Mayne 172
Notes 173
Topics of the Day—On the Formation of a Chemical Compound of Ammonia with Silver Bromide. By J. Vincent Elsden, B.Sc. (Lond.), F.C.S. 174
Telegraphic Transmission of Pictures 175
Dr. J. M. Eder and Captain Pizzighelli 176

PAGE
Bichromate of Potash in the Gelatino-Bromide Process. By Argentic Gelatino-Bromide Paper. By W. T. Morgan 177
Correspondence—Remedy for Frilling—Intensifying Dry Plates 178
Proceedings of Societies—South London Photographic Society—Sheffield Photographic Society—Bristol and West of England Amateur Photographic Association—Photographer' Benevolent Association—Photographic Society of Ireland—Dundee and East of Scotland Photographic Association 178
To Correspondents 180

LOHSE,S METHOD OF PREPARING EMULSION.

In the method of preparing gelatine or collodion emulsion recommended by Dr. O. Lohse in his recent communication to the *Archiv*, the tedious process of washing is avoided*. The entire success of the process hinges upon the solubility of gelatine in acetic acid. When gelatino-bromide of silver is formed in a fine state of division in aqueous solution, it is held in suspension, and refuses to precipitate. But if acetic acid (glacial) be added to the solution, in quantity sufficient to dissolve the gelatine, or to utterly destroy its tendency to set, the solution will be broken up, and the silver bromide precipitated in an impalpable powder, which may be readily utilized.

As in the old method, so in the new, it is necessary to have the combining quantities of silver nitrate and potassic bromide so related the one to the other as to produce an emulsion free from fog. It is also well beforehand, to see to the purity of the potassic bromide employed in the formula. The equivalent of potassic bromide is 119·20, and that of silver nitrate 170·00.

It is advisable, in framing a formula, to set down the proportions thus :—

Potassic bromide	125·00
Silver nitrate	170·00

Take one ounce of distilled water, add to it Nelson's No. 1 photo-gelatine, fifteen grains. In this dissolve the potassic bromide, and after allowing the gelatine to swell, dissolve by heat at about 140° Fahr. When the solution is effected, introduce the silver nitrate in crystals, and dissolve. Now boil for twenty minutes, or for an hour if extreme rapidity is desired. It is of course necessary to conduct the operations under a chemically inert light from the stage when the silver bromide is formed. After boiling, add to the solution, acetic acid (glacial) slightly in excess of the quantity required to dissolve the gelatine. The emulsion thus formed should be made up to a pint with distilled water, and allowed to settle for three or four days. At the end of that time it will be found that the silver bromide has settled down into a compact mass at the bottom of the jar. The water may now be drawn off by means of a syphon, so as not to disturb the sediment.

We recommend that the silver bromide should be again diluted with water, and allowed to settle. This second precipitation removes any trace left of free salts, and should be carried out when the emulsion or plates are to be kept for a length of time.

The silver bromide may be dried finally, and stored in light-tight bottles ready for use. After the second washing, add to the emulsion dilute ammonia drop by drop, and test with litmus paper until all trace of acid is removed. The emulsion should now be made up for use by adding

Gelatine	150 grains
Water	5½ ounces

Complete mixture must be established by vigorously shaking the bottle containing the ingredients. The emulsion should finally be filtered, and plates coated in the ordinary way.

Collodion emulsion may be made by mingling the silver bromide with plain collodion; but, as we have not yet verified this point by actual experiment, we cannot set down definite details of the method to be followed.

We should suggest, however, that a larger proportion of gelatine might be added with signal advantage to form the gelatino bromide of silver, so as to impart greater penetrability to the collodio-gelatino emulsion film.

◆

THE ECONOMY OF SILVER.

Extreme views are entertained by many as regards the general advisability of saving those small traces of silver which constantly tend to flow down the photographer's sink; one section of the photographic community advocating the separation and reduction of every trace of the precious metal, while others regard the extraction of silver from anything less rich than old baths as a waste of time.

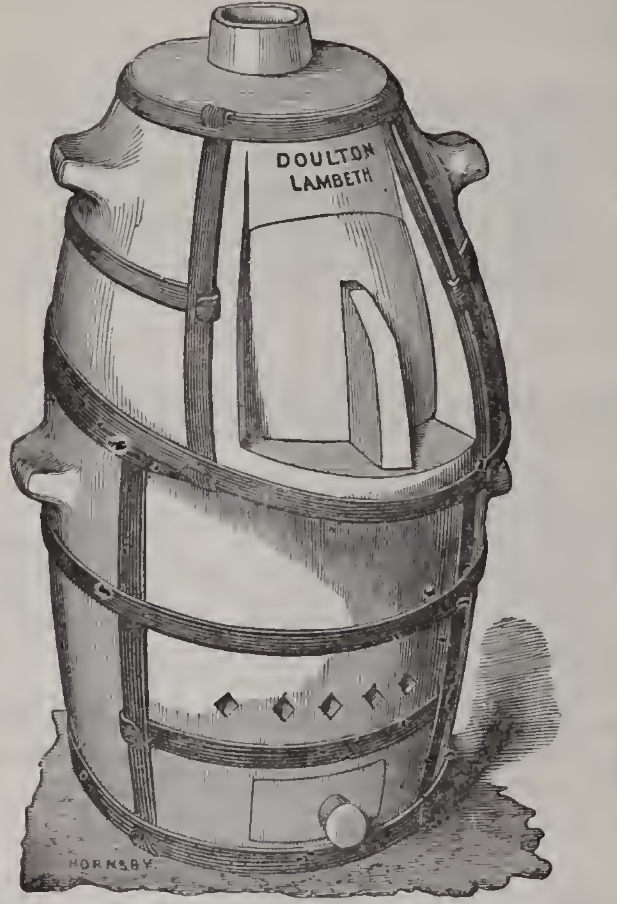
As a matter of fact, all depends on the scale of one's operations, and in a large establishment the extraction of a very minute trace of silver not only pays for itself, but yields a fair profit, while, in many cases, it is much better for the experimenter or the artistic photographer to pay no heed to a trifling waste, his time being more valuable than the silver saved. In a large establishment near London, where negatives up to 36 by 48 inches are constantly produced, and in most cases are cleaned off after a few prints have been made, it is found to be advantageous to save almost every trace of silver. The waste developing and intensifying solutions flow from the sinks into wooden barrels, where the whole of the silver deposits itself in the course of a few weeks; and the old collodion films, which are separated in recleaning the glass plates, yield, when burnt, an ash which consists almost entirely of metallic silver.

It is generally advisable to fuse the silver recovered or precipitated from waste solutions, not only because fusion ensures a complete destruction of all organic matter, but also on account of the ease with which most metallic impurities are eliminated at the same time. In our own laboratory, we often make use of Fletcher's injector or blast gas furnace for the rapid fusion of small quantities of silver; but this apparatus is not well adapted for the use of photographers in many cases, as its use involves an abundant gas supply, and during the time of working a continual roaring sound is produced, this being calculated to give one's neighbours the idea that there is a forge or steam-engine in operation on the premises.

---

* See Photographic News, page 138.

An extremely convenient furnace for the fusion of silver and other metals is represented by the accompanying woodcut, and is manufactured by Messrs. Doulton and Co., of Lambeth Pottery. The smallest size is eighteen inches high by about seven inches in internal diameter, and when fitted with a sheet-iron stove pipe four feet long, it will readily melt from three to four pounds of silver. The furnace may stand out of doors, or it may be placed on an ordinary table, a bend or elbow attached to the chimney serving to carry the products of combustion out through the window. No fire-grate is provided with the furnace in question, the fire being supported by a series of bars of square iron, which pass right through the furnace from front to back, the holes intended for these bars being shown in the cut.



In order to attain the maximum heat which the furnace is capable of producing, certain points must be attended to. In the first place, the coke employed should be dry, clean, and broken into pieces about the size of a walnut; and the best way of lighting the fire is to make use of a few hot coals from another fire, as the light ash left by paper offers a great hindrance to the free passage of air through the fire. During the time the furnace is in action, the upper door must be kept closed, the lower one being open, and the greatest care is necessary in order to keep the ash pit and bars free from accumulation of dust, a hook of stout wire serving as a rake. The fire being now fairly lighted, the crucible containing the silver to be melted is placed in the centre, and clean lumps of coke are picked round it. Things being arranged as above directed, and the bars being kept clear, fusion will be rapidly effected, when more silver can be put into the crucible. In almost every case it is advisable to add a small proportion of sodium carbonate and nitre to silver before fusing it; this addition serving to facilitate the removal of traces of foreign metals, and when the silver is fairly melted it is convenient to granulate it by pouring it into cold water It is then ready for conversion into nitrate; but those who reside in London will often find it advantageous to exchange the metallic silver for nitrate, this salt being largely produced as a residual product during the operation of "parting" gold and silver, and a refiner can afford to give nearly or quite as much of the salt as contains the quantity of silver exchanged.

We need not enter into particulars here regarding the separation of metallic silver from solutions, as this subject has been frequently treated of in the News and Year-Books; but we may mention that, in most cases, a bar of clean zinc forms the most convenient precipitant, and the silver thrown down should be well washed and dried before it is put into the crucible for fusion.

Those who find it inconvenient to exchange their metallic silver for nitrate, and, consequently, convert their reduced silver into this salt themselves, will find it convenient to dissolve the metal in a beaker or basin placed on an outside window-ledge, a Bunsen burner or spirit lamp serving to provide the necessary heat. The acid should be diluted with about its own volume of water, and when the solution of the metal is complete, the excess of acid may be evaporated without disturbing the arrangement, any trace of blackish powder (gold) being allowed to remain, as it can easily be filtered out when the salt is dissolved for use.

Those who object to evaporating away the excess of acid can avail themselves of the ingenious plan mentioned on page 160 of our issue last week.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Glazing without Putty—A Curious Optical Effect—"Perfection" in Photography—The Building Exhibition.

Glazing without Putty.—Mr. J. C. Stephens' suggestion for glazing studios without putty is not a novel idea. Some years ago a gentleman, then manager of an india-rubber manufactory, and an enthusiastic horticulturist, submitted to us a modelled section of a plan for glazing roofs without putty, which seemed to be admirably suitable for photographic studios, as the roof so constructed would be absolutely water-tight. The method is difficult to describe without the aid of an illustration, but it consisted of a deep groove cut in the sash on to the edge of which (the groove) was screwed a thick strip of india-rubber. The rubber in the specimen submitted consisted of two samples of varying elasticity, that nearest the wood being much harder than the other. The groove was so cut as to have a portion of the sash projecting over the rubber, and the glass was inserted between the rubber and the projecting ledge, the elasticity of the former keeping it firmly in its place. The advantage of this method is that the expansion or contraction of the glass in hot or cold weather does not make any difference, as in the case of putty. The elasticity of the india-rubber acts admirably as a "compensating" quality, and, in addition, the glass is pressed so tightly against the sash that moisture, even by capillary attraction, cannot find its way in. Should, however, there be a leakage, owing to unevenness in the projecting ledge, no harm is done, as all wet will simply fall into the groove, which acts as a channel, and can be made to discharge its contents into a gutter. We should be inclined to think that iron sash frames would answer better than wood, as they can be made of equal strength, but of a much more slender form, and so would obstruct less light. It is curious that no maker of horticultural houses has devoted himself to improvements in the construction of photographic studios. A maximum of strength, combined with a minimum of obstruction in the way of sash bars, and, above all, to be perfectly water-tight, ought not to be such a difficult problem to solve.

A Curious Optical Effect.—A French photographer and student in the science of optics, M. Trève, has lately described some curious effects. Looking through a fine slit at a vertical object (a post or a mast, for instance), he finds the perception much more distinct when the slit is horizontal than when it is vertical. On the other hand, to distinguish horizontal lines more clearly, the slit must be held vertically. But if, in general, one look at a house or a landscape through a fine slit, it is found that the maximum of brightness of the horizon is when the slit is horizontal. This effect, it is said, is also produced with the solar and lunar discs: they are seen much more distinctly with the horizontal slit. M. Trève has reproduced the effect by photography, and the negatives taken with the horizontal slit were more distinct. The light appears to be propagated with more intensity through the latter than the former, the vertical bands of solar photographs showing well the interferences and passage of light through a vertical slit. Again, if a cross-slitted disc be held between the sun and white screen, the horizontal part of the cross on the screen is brighter than the vertical. The practical application of these experiments of M. Trève to photography would appear to be the relation which they bear to the shape of the apertures of diaphragms and to instantaneous shutters. Is it a fact with regard to the latter that the uncovering of the lens horizontally admits more light, and therefore produces a picture more quickly than a shutter which opens vertically? There may be no difference, but the point, at any rate, is worth deciding.

Perfection in Photography.—The division which exists in the photographic ranks—not so marked now as it used to be—between those who believe in the latest improved apparatus and extreme accuracy of manipulation, and those who do not care for mechanical perfection so long as the result is artistic, is just now paralleled in the Microscopical Society. Its members are divided into two great parties, one consisting of "Brass and Glass" men, and the other of "Slug and Bug" men. To prevent any misconception as to the meaning of these terms, we may as well explain that the former think that accuracy and perfection of the microscopical instrument, the "brass and glass," are of paramount importance; while the latter adhere to the belief that in microscopical researches, the study of "slugs and bugs" should be placed first. Mr. Mayall, Junr., who is a "brass and glass" man, has lately been reading a paper on the subject, defending his party from the charge that they cared for nothing but mere display of elaborate apparatus. His argument was that the most conspicuous developments in recent microscoping, particularly the delineative of microscopic objects by means of micro-photography, were absolutely dependant on the perfection of the instrument, and therefore the improvement in the instrument itself was by no means so "petty" a subject as it had been sought to insinuate. Mr. Mayall undoubtedly has right on his side, but the controversy seems to be very much like the well-known contest respecting the gold and silver shield.

The Building Exhibition.—Those who are anxious to see either Balmain's paint or Spence's metal can do so at the Building Exhibition now open at the Agricultural Hall. Messrs. Ihlee and Horne have a cottage, the ceilings and walls of which are coated with their luminous wash. To show what a difference demand makes in the price of an article, it may be mentioned that the luminous paint, which was originally sold at 28s. per lb., can now be obtained at 6s. per lb.; the wash, which is a variation of the original preparation, is 2s. 8d. per lb. The operation of melting Spence's metal, and casting it in moulds, can also be witnessed. The operation is of the simplest. A gas jet and an ordinary saucepan, and the whole of the melting apparatus is complete. The rapidity with which this curious compound cools is as remarkable as its low point of fusibility. In less than two minutes from the time it was poured into the mould a block about four inches square and half an inch thick could be handled. With regard to its substitution for type metal, and for the metal plates in photo-zincography, as suggested in the News some time ago, we are informed that some modification in the process of making the compound would be necessary to overcome the brittleness which the present form of the metal possesses.

At Home.

MR. HORACE WILMER AT THE GREAT EASTERN RAILWAY.

Liverpool Street Station, with all the life and bustle of a London terminus, with the incessant coming and going of sinuous trains, with parallel lines crossing and recrossing in every direction, with signals and semaphores proclaiming danger on all hands, with shouting guards and hurrying porters, with belated passengers and bewildered officials, with hissing steam and shrieking whistles, and amid the deafening and distracting scene, Mr. Wilmer quietly suggesting that we shall walk along the line to Bishopsgate. We decline politely, but distinctly. We have no wish to dispute the passage, even for an instant, of any of the rumbling trains through those tunnel-like vaults in the distance. Thereupon Mr. Wilmer proposes taking the train to the next station, a suggestion much more in accordance with our sentiments.

It is to the old Shoreditch Station of the Company we are going. Mr. Wilmer's company is decidedly convenient, to say the least. There is no trouble about taking tickets, no inquisitorial examination by inspectors, no gruff warnings from porters or signalmen. Gates fly open before we touch them, and forbidden thoroughfares invite our presence. We meet the President of the Photographic Society, hale and hearty as usual, on one of the platforms, and exchange a few words; but even he is only an ordinary commonplace passenger, like the rest of them, and presently we leave him to his fate with the rest of the vulgar crowd. We pass on—rather more erect, perhaps, than usual—through barrier and wicket without so much as an "Open Sesame." Once—but only once—an inattentive gatekeeper presumed to bar our passage, but receded again, as a servile slave should do, at the magic word "pass."

There are two ways in which photography is made to do yeoman's service by the Great Eastern Railway. The more important, possibly, is the printing of plans and designs by the Pellet process, which we shall presently see in operation farther down the line at Stratford; the other is the use of the camera in recording the progress of engineering work. As regards the copying of draughtsman's work instead of tracing it, we must compliment the Great Eastern Railway Company and the Engineer-in-Chief, Mr. A. A. Langley, for so quickly appreciating the value of photographic printing in the drawing department. It is usually a long time before old-established customs and prejudices can be upset, but Mr. Langley seems at once to have understood the advantages of photography, not only as a cheap method of copying, but as one honest and trustworthy as the day itself. The Company may be pronounced in the van in this respect, and its engineer is likely to find many followers in carrying out similar work.

But this is the new goods station that Mr. Wilmer has brought us to see first of all, and here he is "at home." There is nothing very taking in the mention of a goods station, but when we say that the structure in question is to be the biggest building in London, and probably the largest goods station in the world, you can hardly look at it without interest. So spacious is this magnificent pile, that one of the London streets dives under at one side and comes out again at the other without attracting any particular notice. There are four distinct floors in the vast semi-circular structure—or, rather, there will be when it is finished—and when we mention that heavy lumbering goods trains, with their loads of fish, fruit, meat, &c., are to be permitted to come thundering along into the second and third storey, it follows as a matter of course that floors and ceilings must be pretty substantial.

Iron bridges and girders play an important part in the building. "That one going up now weighs twenty-two tons," says Mr. Wilmer, as we watch a huge red mass hoisted up into its place. It is in respect to this ironwork that photography renders valuable service. Mr. Wilmer employs the camera to record work done, the photographs he takes supplying illustrations to what are termed "progress reports." It is one thing for a contractor to deliver a lot of iron-work, and another to put it into position. "We only pay for iron when it is fixed, not when it is simply on the ground," Mr. Wilmer informs us, and under these circumstances the reader at once sees how valuable photographic records may be made. Mr. Wilmer puts a date carefully to every negative he takes, so that a mere glance at the picture shows at once how much iron-work was "fixed" on a certain day.

As many of our readers know, this useful application of photography is not new. In the construction of one of the South American railways, by Messrs. Peto and Brassey, the engineers carried the use of photography further still, for they paid the monthly bills of the contractors on certificates vouched for by the camera. The works, indeed, were carried on for a long time under no other eye than that of the camera. Every month the representative engineer of Peto and Brassey sent his progress report to London, notifying that the contractors, having completed a certain length of line, or built certain bridges, were entitled to further pay, and, in proof of his assertion, photographs were transmitted, showing distinctly that the progress in question had been made.

But Mr. Wilmer employs photography not only to show how much iron-work has been fixed, but the mode in which the work is done. The hoisting-up of heavy and cumbrous girders is no easy task, and an engineer up to his business loses no opportunity of gaining experience of the way in which other men go to work. Whenever work of extraordinary interest takes place, especially in the lifting of heavy weights, in or near London, Mr. Wilmer takes with him his camera, and secures a picture of the machinery brought into use—the gyns, derricks, hoists, pulleys, &c., that may be employed. A photograph shows the whole structure and combination of tackle at a glance, and a record is secured ten times the value of the most elaborate description.

Mr. Wilmer shows us a whole sheaf of "progress" pictures, a most important series, which form, indeed, by reason of the dates thereon, a perfect history of the "biggest building in London." Here is one clear little picture with the broad Shoreditch thoroughfare in the foreground and the big station beyond. "I took that picture," said Mr. Wilmer, "to find out what was the *minimum* exposure one could give of a London street when vehicles are moving rapidly to and fro, in order to obtain a result in which such movement did not interfere. I gave three seconds, and you see the whole front of the building is clear; whereas a rapid uncapping of the lens yielded a photograph that was blurred all over." Mr. Wilmer's pictures, the essence of clearness and brightness, proved clearly that the lesson was one to be taken to heart, especially by London photographers.

We leave Mr. Wilmer's little home, and quit the Shoreditch works—a big village of busy workmen covering upwards of sixty acres—and proceed down the line to Stratford. Here the locomotive works of the Company are situated, and here are the draughtsmen's offices. As a matter of course, the construction of new machinery entails the designing and elaboration of numerous plans, and it is in the copying of these that photography is here made available. The plan is treated as a negative, placed in a huge printing-frame with a sheet of Pellet paper under it, and then exposed to light. The Pellet paper is a patent material, akin in its preparation to Herschel's cyanotope paper; but while the latter printed under a plan gives white lines on a blue ground, the Pellet paper yields blue lines on a white ground. We have several times described the preparation of the paper, and its development, in these columns, and need not, therefore, specially refer to it, except, perhaps, to say that its cost is about one shilling the square yard.

Printing plans by photography instead of tracing them by hand, is obviously a most economical innovation. Some of the plans—or "arrangements," as they are termed—are so elaborate, that the tracing of them costs no less than £5. A photograph of the plan, on the other hand, supposing it does not exceed a yard square, would cost little more than a shilling; and, instead of taking a fortnight to prepare, could, in summer time, be produced in half-an-hour. Moreover—and this is most important—there is no need of checking afterwards by a highly-paid draughtsman. In the photograph you are quite sure not a single line has been omitted—not even the most insignificant—and no figure or measurement has been incorrectly copied. When machinery is to be purchased or constructed, tenders are invited from contractors on all sides, and these, naturally enough, want a copy of an "arrangement" before they can make a bid. By the aid of photography, these copies from the costly original are now made without difficulty, and the chief draughtsman can rest with a quiet mind, knowing full well that all copies he issues to contractors are correct, down to the most minute particular. The enormous gain, both in labour and in material, is, therefore, very evident.

To draw the original plan in opaque ink —indian-ink— and to see that the huge printing-frame is capable of exerting considerable pressure, so that the two surfaces of paper, or tracing-cloth and paper, may be thoroughly in contact, are the only two material points to be attended to in the copying of plans of this nature. Timing the exposure needs also some experience, for it varies from seventy seconds in a summer's sun, to a whole day in dull wintry weather. A trustworthy actinometer is at hand in a strip of the prepared paper, which is gummed to the printing-frame, and torn off bit by bit, and immersed in the developing bath to ascertain the depth of printing. An intelligent draughtsman experiences no difficulty whatever in carrying out the process after a day's practice.

The "Bye-the-Bye" next week will be "Articles de Paris"; the following "At Home" will be "At the School of Gunnery, Shoeburyness."

GELATINE TRANSPARENCIES FOR THE LANTERN.

BY THOMAS MAYNE, T.C.[*]

Few of those who work with gelatine dry plates seem to be aware of the great beauty of the transparencies for lantern or other uses which can be made from them by ferrous oxalate development with the greatest ease and certainty. I think this a very great pity, for I hold the opinion that the lantern furnishes the most enjoyable and, in some cases, the most perfect of all means of showing good photographic pictures. Many prints from good negatives which may be passed over in an album without provoking a remark will, if printed as transparencies and thrown on the screen, call for the expression of the warmest admiration, and justly so, for no paper print can do that full justice to a really good negative that a transparency does; and this difference is more conspicuous in these days of dry gelatine plates and handy photographic apparatus, when many of our most interesting negatives are taken on quarter or five by four plates, the small size of which frequently involves a crowding of detail, much of which will be invisible in a paper print, but which, when unravelled, or opened out, as it were, by means of the lantern, enhances the beauty of the pictures immensely.

When I last had the pleasure of bringing this subject before the members of our Society, it may be remembered that I demonstrated the ease and simplicity with which those beautiful results may be obtained by printing in an ordinary printing-frame by the light from my petroleum developing lamp, raising one of its panes of ruby glass for the purpose for five seconds, and then developing by ferrous oxalate, until I got the amount of intensity requisite. On that evening, in the course of a very just criticism by one of our members, Mr. J. V. Robinson, he pointed out what was undoubtedly a defect, viz., a slightly opalescent veiling of the high lights, which should range from absolutely bare glass in the highest points. He showed that in consequence of this veiling the light was sensibly diminished all over the picture. This veiling of the high lights was a serious disadvantage in another important particular, inasmuch as it lessened the contrast between the lights and shadows of the picture, thereby robbing it of some of its charm, and deteriorating its quality. Since that evening I have endeavoured, by a series of experiments, to find out some means by which this opalescence might be got rid of in the most convenient manner.

---

[*] Read before the Photographic Society of Ireland.

Cementing the transparency to a piece of plain, clear glass with Canada balsam, as suggested by Mr. Woodworth, I found in practice to be open to two formidable objections; one of which was that Canada balsam used in this manner is a sticky, unpleasant substance to meddle with, and takes a long time—nearly a month—to harden, when confined between plates in this manner. The other objection was of extreme importance, viz., that in consequence of commercial gelatine plates not being prepared on perfectly flat glasses in all cases, I found that after squeezing out the superfluous balsam and the air-bubbles that might have formed from the two plates, they are liable to separate at the places where the transparency is not flat, causing air-bubbles to creep in from the edges, as you may see from these examples. I have therefore discarded this method, although it had the effect desired when successfully done.

I have hit, however, upon another way of utilizing Canada balsam, which, while retaining all the good qualities of the former method, is not subject to any of its disadvantages. This consists in diluting the balsam with an equal bulk of turpentine, and using it as a varnish, pouring it on like collodion, flowing it towards each corner, avoiding crapy lines by slowly tilting the plate as in varnishing. If the plate is warmed previously, the varnish flows more freely, and leaves a thinner coating of balsam behind in the transparency.

When the plate has ceased to drip, place it in a plate-drainer with the corner you poured from lowest, and leave it where dust cannot get at it for four or five days, when it will be found sufficiently hard to be put in a plate-box. The transparency may be finished at any time afterwards by putting a clean glass of the same size along with it, placing one of the black paper masks sold for the purpose (either circular or cushion-shaped to suit the subject) between the plates, and pasting narrow strips of thin black paper over the edges to bind them together.

This method is very successful, as you may see from the examples. It renders the high lights perfectly clear, and leaves a film like glass over all the parts of the transparency where the varnish has flowed.

In order to avoid the risk of dust involved in this process, I tried other means of arriving at similar results, and with success, for the plates I now submit to you have been simply rubbed or polished, as I may say, with a mixture of one part of Canada balsam to three parts of turpentine, using either a small tuft of French wadding, or a small piece of soft rag for the purpose, continuing the rubbing until the plate is polished nearly dry. This method is particularly successful, rendering the clear parts of the sky like bare glass. I have here a plate which is heavily veiled—almost fogged, in fact—one-half of which I have treated in this way, showing that the half so treated is beautifully clear, although the other half is so veiled as to be apparently useless. I have tried to still further simplify this necessary clearing of the plates, and find that soaking for twelve hours in a saturated solution of alum after washing the hypo out of the plate is successful in a large number of cases, and where it is successful there is no further trouble with the transparency, except to mount it after it becomes dry. Where it is not entirely successful, I put the plate into a solution of citric acid, four ounces to a pint of water, for about one minute, and have in nearly all cases succeeded in getting a beautifully clear plate. The picture must not be left long in the citric acid until after trying the alum for a similar reason. I may mention that I recommend a short exposure in the printing-frame, and slow development, in order to get sufficient intensity (of course the exposure is always made to a gas or petroleum light). I also still prefer the old method of making the ferrous oxalate solution—pouring it back into the bottle each time after using, and using it for two or three months, keeping the bottle full from a stock bottle, and occasionally putting a little dry ferrous oxalate into the bottle and shaking it up, allowing it to settle before using it next time. By treating it in this way, it retains its power fairly well for a long time, and as it becomes less active I give a little longer exposure, balancing one against the other.

Making the ferrous oxalate solution from two saturated solutions of iron sulphate and potassium oxalate has not succeeded so well with me for transparencies; the tone of the picture is not so black as when developed by the old method, and I do not like grey transparencies for the lantern. I also recommend very slow gelatine plates, about twice as sensitive as wet collodion—not more if I can help it.

I have demonstrated, I hope to your satisfaction, the possibility of producing lantern slides from commercial gelatine plates of a most beautiful quality, ranging from clear glass to deep black, and giving charming gradation of tones, showing on the screen a film as structureless as albumen slides, without the great trouble involved in making them.

You must not accept the slides put before you this evening as the best that can be done with gelatine; far from it, they are only the work of an amateur with very little leisure now to devote to their manufacture, and are merely the result of a series of experiments which, so far as they have gone, I now place before you.

◆

Notes.

There is to be a Congress of German photographers at Frankfort this summer, and the local photographic society will take the opportunity of holding an exhibition at the same time.

Dr. J. M. Eder promises, in an early number of the News, to describe a new and thoroughly practical method of producing cyanotype prints.

The Vienna Exhibition is more popular than our own in Pall Mall. While with us the number of visitors has barely reached 10,000, even in the best years, already 25,110 persons have visited that in the Austrian capital. One of the most attractive exhibits, we are told, is the fine study of swans by Messrs. Marsh Brothers. The Exhibition remains open until the 8th May.

We spoke the other day of phosphorescent photographs. These are particularly beautiful when produced in the form of thin positives upon glass. Silver prints are less suitable for the purpose than carbon or mechanical impressions, for the former, after long contact with the phosphorescent paint, naturally enough get contaminated by the sulphur, and the result is the formation of yellow spots on the phosphorescent photograph.

What is the best wind to photograph in? We all know that Mr. Dixon, in photographing his lions and tigers at the Zoo, objected to an east wind. On Tuesday evening Captain Abney, at the Photographic Society, expressed a preference for a westerly wind, while Colonel Stuart Wortley was of opinion that wind in the north-west was most favourable. On the whole, however, we rather incline to Mr. Payne Jennings' belief, that photographers are best off when there is no wind at all.

At the last meeting of the South London Society, this lesson was undoubtedly taught: that a good lens in the lantern is as indispensable as a good lens in the camera.

Professor Helmholz, of Berlin, was entertained at a *soirée* on Monday, by the Society of Telegraph Engineers. On the occasion Mr. Shelford Bidwell exhibited his tele-photographic machine, by which a picture may be produced at a distance of many miles from the object to be photographed. The outline of a butterfly, with the markings on the wings, was in this way very distinctly reproduced on Monday night.

"There are now twenty-eight Swan lamps in use at the offices of the Lancashire and Yorkshire Railway, Manchester," says the *Engineer*, while other good news in relation to Mr. Swan's invention is contained in the *Electrician*, which tells us the Earnock Colliery at Motherwell is at once to be lit by the lamp, and that if the experiment is successful, other coal pits will be similarly illuminated.

The Russian journal which represents the photographic section of the Imperial Polytechnic Society in Russia, publishes this month, as frontispiece, a sad *souvenir* of the murdered Czar. It is the portrait taken by Levitsky, the Court photographer, the day after the assassination. The late Emperor of all the Russias is clad in uniform, his head raised upon a pillow; the eyes are closed, the lines of his care-worn face are painfully marked, and the features indicative of deep suffering. The portrait is a mechanical print, and proves that the Russian capital is not behind the rest of Europe in this branch of the art.

In the next "By-the-Bye," to be entitled "Articles de Paris," we shall discuss any novelties that may attract our attention in making a round of the Paris studios during the Easter holidays.

It is likely that thin collodion films will become popular with microscopists, for M. Gripon has found that, stripped from glass, they not only reflect light exactly as glass does, but they polarize it as well, both by reflection and by transmission of the ray through its substance. M. Gripon has also found that collodion films 0·01 millimetre in thickness may be obtained, which transmit a very large proportion of radiant heat. Polarizing piles, he tells us, may be formed of these layers of collodion film without difficulty.

Everybody knows how electric a collodion film becomes if subject to friction. M. Wiedermann lately described, in the *Comptes Rendus*, a method of producing "electric paper," which is, after all, nothing but pyroxyline. Ordinary filter paper—Swedish is best—is steeped in a mixture of nitric and sulphuric acids, as in the manufacture of gun-cotton; it is then washed in plenty of water and dried. This electric paper, laid upon waxed paper and rubbed briskly, will emit sparks several centimetres in length.

"How I Keep my Books," by a Lady. We want a short practical article on this subject, and any of our readers who would favour us by writing, we refer to the last page of this week's News. We shall be glad to forward a cheque for two guineas to the authoress of the article we publish.

The sensitiveness of selenium to radiation is to be made use of in regulating the heat of muffle furnaces. The concentration of rays, more or less, upon selenium, influences the electric conductivity of the material, as most people know, in a marked degree, and this property M. Germain proposes to make use of to control the heating of furnaces. A window in the furnace, made of very refractive alumina glass, permits the red glow to reach a distant mirror; the rays are reflected upon selenium, and when the light reaches a certain stage of brightness the electric action of the selenium conductor is such that it acts on a mechanical arrangement by which the fire-bars of the furnace are withdrawn. The fuel of the furnace is thus allowed to fall out as soon as the right temperature for fusing enamels has been reached. If a self-acting selenium actinometer of this kind will permit the firing of enamels with certainty, photographers will not be slow to avail themselves of it.

Many of our battle-ships are fitted with the electric light, and now one of the new ironclads is to receive on board an electric lamp on the Brush principle, of 100,000 candle power. It is the most intense light by far yet manufactured, and requires a 40-horse power engine to work. The light is intended for sweeping the seas at night so that no torpedo craft can approach unawares; as also for detecting breakers when approaching the coast. The light in question is likely to show objects of this kind distinctly at upwards of a mile distant.

Topics of the Day.

ON THE FORMATION OF A CHEMICAL COMPOUND OF AMMONIA WITH SILVER BROMIDE.

BY J. VINCENT ELSDEN, B.SC. (LOND.), F.C.S.

The following observations will probably be interesting to many who may be studying the influence of ammonia in emulsion; for, although the results contained in the following lines were obtained by the action of concentrated ammonia solution upon silver bromide in the absence of organic matter, yet it seems probable that similar reactions will occur, to some extent at least, in all cases in which ammonia is added to gelatino-bromide emulsions.

The bromide of silver was prepared by precipitation, and carefully washed by decantation. Its colour was then pale yellow; but on placing a quantity into a bottle containing sufficient concentrated ammonia solution (sp. g ·880) to dissolve it, the colour immediately became white, and remained so, even in full daylight, until the solution was complete.

From this solution of bromide of silver in ammonia, the salt appears to be deposited in at least four distinct modifications; and, in order to explain more clearly under what conditions a true chemical compound of ammonia with silver bromide is capable of being deposited, I have thought it well to describe each of these different forms in the order in which they were observed. All the observations were made with the microscope, and the one-inch objective was employed throughout. The results obtained both by bright daylight and by lamplight were identical.

1. On placing one drop of the original saturated solution, diluted with five drops of water, beneath the microscope, it will be observed that, on evaporation, nearly the whole of the bromide is deposited in the form of *brilliantly-coloured transparent crystalline plates* of very perfect and regular forms, amongst the most frequent of which are the regular hexagon and the equilateral triangle (see fig. 1.)

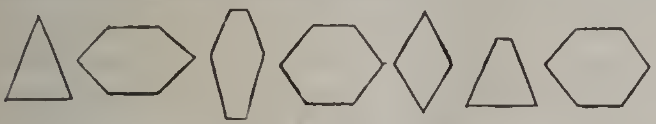


Fig. 1.

Forms of silver bromide deposited from ammonia solution.

The size of the crystals varies considerably from less than $\frac{1}{1,000}$ in. to more than $\frac{1}{100}$ in.; but their thickness can scarcely amount to $\frac{1}{20,000}$ in., being almost inappreciable beneath a high power of the microscope.

These crystals have various and most beautiful shades of colour, both by transmitted and reflected light; they sparkle with great brilliancy and appear blue, green, yellow, and red indiscriminately. Generally, each crystal has its own colour throughout; but sometimes a crystal appears divided into two parts, each with a distinct shade of colour, as if it were a twin crystal. Less frequently appear variegated crystals. The crystals have no influence upon polarised light when lying flat; but they appear to be doubly refractive when the rays pass obliquely through them, as if they belonged to the hexagonal system.

The crystals, unlike ordinary bromide of silver, are perfectly stable, even in strong sunlight. When exposed for days to its action they present no difference, either in colour, transparency, or brilliancy. Hyposulphite of soda, as well as ammonia, dissolves the crystals, except a thin brown film retaining the original shape, such as would be the case if they consisted of the sub-bromide, as in the equation—

$$Ag_2\,Br + Na_2S_2O_3 = Ag_2S_2O_3 + 2\,Na\,Br + Ag_2$$

Although this view is also supported by the stability of the crystals in daylight, it requires still further confirmation.

2. When the original saturated solution is used, diluted with not more than an equal volume of water, the bromide is deposited in a modification quite distinct from the above. As the evaporation of ammonia goes on, the solution is seen to become filled with square and oblong, transparent, colourless crystalline plates, generally of very perfect form, but sometimes showing regular deviations from their normal shapes, owing probably to imperfect crystallisation (see fig. 2).

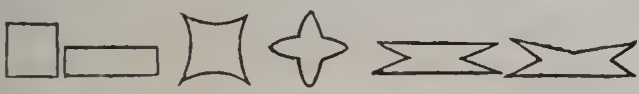


Fig. 2.

Forms of crystals deposited from concentrated solutions of silver bromide in ammonia.

The thickness of these plates is about the same as that of those described above. Although perfectly colourless by transmitted light, by reflected light they shine with the most splendid tints of colour. Under the action of polarised light they are seen to be strongly dichroic, being alternately light and dark four times in a complete revolution of the crystal between crossed nicols. These crystals are, therefore, doubtless tetragonal. With polarised light they appear generally of a pale lavender colour, even by transmitted light.

These crystals are exceedingly unstable, and appear to be incapable of existence in the absence of ammonia; for when evaporation reaches a certain stage, they all disappear and leave nothing but an opaque, brownish residue in their place; but I was able to collect a number of these crystals in a test-tube, which, when inverted, suffered the liquid to be drained off, leaving the crystals dry. They then appeared tolerably stable in diffused daylight, remaining quite unchanged. On warming the tube, even slightly, however, they at once were converted into opaque, yellow bromide of silver, which quickly turned slate-brown in daylight. The same decomposition of the crystals was effected by the addition of water or of acids.

Evidently these crystals consist of a compound of ammonia and silver bromide in a state of very loose chemical combination, the slightest change of conditions being sufficient to dissociate the ammonia and to leave only silver bromide. The action of re-agents upon this substance, to which a formula $NH_3\,Ag\,Br$ may perhaps be assigned, may be thus represented—

$$NH_3\,Ag\,Br + H_2O = Ag\,Br + NH_5O$$

while the effect of heat is a simple dissociation.

$$NH_3\,Ag\,Br = NH_3 + AgBr.$$

3. In each of these former cases the bromide was deposited by rapid evaporation. If the solution is left for some days to evaporate slowly, the bromide is deposited in neither of the two forms described above, but as solid green cubical crystals, having generally the form of the octahedron, or its combination with the cube. These crystals are perfectly transparent, of great lustre, and retain their green colour for some time, even in bright daylight; but they appear to darken slowly, and to undergo a gradual conversion to sub-bromide after a prolonged exposure to light. These crystals, which appear to be an artificial form of the mineral bromite, appear to be the final result of deposition from an ammoniacal solution of silver bromide in all cases of slow evaporation.

4. Lastly there appear, generally mixed with the forms previously mentioned, varying quantities of granular bromide, but evidently differing from the original bromide in size as well as in physical properties, being far more prone to decomposition by the action of light.

On the whole, it is evident that silver bromide, deposited from its solution in ammonia, is no longer in the same condition as before its solution. It seems certain, also, that under certain circumstances (2), a definite compound of ammonia with silver bromide is formed. If this be true, silver bromide is capable of retaining ammonia to some extent; and the statement of Rammelsberg, that silver bromide absorbs no ammonia, seems not to be rigorously correct in all cases.

The stability of the coloured crystalline plates (1) is interesting; but it would be difficult to decide whether they consist of bromide or sub-bromide. If the latter is the case, we may assume that ammonia has, in some cases, an action upon silver bromide similar to the following—

$$2\,NH_5O + 4\,Ag\,Br = 2\,Ag_2Br + 2NH_4Br + H_2O$$

But it scarcely seems probable that, in the absence of organic matter, ammonia should have this reducing action upon the silver salt. For the present, therefore, it will be sufficient to restate the unmistakable results of the above observations, viz.,—

1. That ammonia is capable of forming with silver bromide a definite chemical compound.
2. That it is also capable of transforming silver bromide into a coloured, transparent crystalline body, which is stable in strong sunlight.
3. Lastly, that in all cases of deposition from solution in ammonia, the physical condition of the bromide is completely changed.

◆

TELEGRAPHIC TRANSMISSION OF PICTURES.

At a recent meeting of the Physical Society, Mr. Shelford Bidwell explained a method he had devised of transmitting pictures—or, rather shadows—by electricity.

The positive pole of a battery is connected through a set of resistance-coils to a piece of platinum wire, and the negative pole to a plate of zinc, upon which is placed a sheet of paper moistened with a solution of potassium iodide. The negative pole of a second battery is connected through a selenium cell with the same platinum wire, and the positive pole to the zinc plate. The point of the platinum wire is pressed upon the paper, and the selenium being exposed to a strong light, the variable resistance is so adjusted that the currents from the two batteries which pass through the paper in opposite directions exactly neutralise each other. The platinum point will now make no mark when drawn over the paper; but if the selenium is shaded, its resistance is immediately increased; the current from the first battery then predominates, and the path of the platinum point across the paper is marked by a brown line due to the liberation of iodine. The line is fainter the feebler the light is. This arrangement has been applied by Mr. Bidwell in his "telephotograph," exhibited to the meeting. The transmitter consists of a brass cylinder mounted on a screw spindle which carries the cylinder laterally 1-64th inch at each revolution. A pin-hole in the middle of the cylinder allows light to fall upon a selenium cell placed behind it within the hollow cylinder. The cell is connected in circuit with a battery and the line. The receiver consists of a similar metal cylinder mounted so as to rotate synchronously with the first, and having a platinum point pressing upon a sheet of chemical paper wrapped round the cylinder. This receiver and transmitter are connected up as described above with two batteries and a set of resistance-coils.

The image to be transmitted is focussed upon the cylinder of the transmitter and the resistance adjusted, and the receiving cylinder covered with sensitised paper. The two cylinders are caused to rotate synchronously, the pin-hole in the course of its spiral path covering successively every point of the focussed picture. The amount of light falling upon the selenium will be proportional to the illumination of that particular spot of the projected image which is for the time being occupied by the pin-hole, and the intensity of the line traced by the platinum point in the receiver will vary in the same proportion. These variations will produce a picture which, if the instrument were perfect, would be a counterpart of that projected upon the transmitter. Simple designs cut out of tin-foil and projected by a lantern have been successfully transmitted. With selenium and paper of greater sensitiveness more perfect results might undoubtedly be obtained. Professors Ayrton and Perry showed an experiment illustrating their plan for sending light and shade images by electricity. A selenium cell was connected in circuit with a battery and a coil of wire surrounding a tube along which a beam of light passed. A shutter having a small magnet attached was suspended in the tube like a galvanometer mirror, so that when a current traversed the coils, the shutter was deflected so as to close or partially close the tube and shut off the beam of light. It will be understood that when a ray of light fell on the cell and diminished its resistance, the current in the coils would increase to a degree proportional to the intensity of the ray, and thus the shutter would proportionally cut off the light in the receiver. If now a number of these elementary circuits were combined so as to provide a mosaic of cells to transmit the reflected image of an object, and a screen to receive the corresponding beams of light controlled by the shutters at the other end of the line, there would be a means of sending light and shade images by wire.

◆

BICHROMATE OF POTASH IN THE GELATINO-BROMIDE PROCESS.

BY DR. J. M. EDER AND CAPTAIN PIZZIGHELLI.[*]

1. *The Cure of Fog-Producing Emulsion by Means of Potassium Bichromate.*—Potassium bichromate destroys the invisible image on bromide plates (before developing), and generally brings back silver bromide, which develops fog, to its normal state. Abney suggested the restoration of a fog-producing emulsion by squeezing it through a canvas bag into a half to two per cent. solution of bichromate of potash, letting it lie there for from four to five hours, and then, by washing for another hour, removing all the bichromate. The salt cures the fog, and the emulsion gives brilliant pictures; but if the bichromate be not thoroughly washed out, the sensitiveness of the emulsion is, according to Abney, reduced to one-third. Our own experiments enable us to affirm that a foggy emulsion, whether in the form of a jelly, or dry on glass plates, is always cured by several hours' soaking in a two per cent. solution of potassium bichromate, unless the fog be at first too strong. When we attempted to eliminate the fog from an emulsion which had been rendered powerfully foggy by boiling for one-and-a-half hours, we were unable to obtain a perfectly satisfactory result, although there was considerable improvement. At all events, we can recommend this method of restoring foggy plates as the best yet known, and as one which does not in the least degree injuriously affect the structure and rigidity of the film; but, unfortunately, notwithstanding the completest washing, the treatment with bichromate always causes a loss of sensitiveness.

2. *Dr. Kenyon's Method of Preparing Highly-Sensitive Gelatino-Bromide.*—Kenyon set out with the principle that the sensitiveness of silver bromide emulsion increases continually with cooking, and that it is "the setting in of fog which limits the attainment of sensitiveness."[*] He recommends, therefore, heightening the sensitiveness by continuous boiling, regardless of the formation of fog, and then eliminating the latter by means of potassium bichromate; the result ought to be an exceedingly sensitive, clear-working emulsion. The great advantage claimed for this method is that the emulsion may be prepared by any kind of artificial light, or even by light of day. In a leading article of the PHOTOGRAPHIC NEWS,[†] however, it is stated that the sensitiveness of an emulsion after one and a-half hours' boiling, and then washing in a two per cent. solution of bichromate, is not greater than that of an emulsion boiled only for a short time, and subsequently treated with ammonia; though, as is suggested, the "result may have been due to imperfect elimination of the bichromate."

We repeated these experiments with the greatest care. We prepared an emulsion according to the directions in Dr. Eder's work (*Theorie und Praxis der Photographie*, p. 66), and divided it into three parts. The first we used for coating the plates directly, without any further cooking; the second we boiled for half-an-hour, and obtained a highly sensitive and clear-working emulsion; and with the third we continued the boiling for one hour and a half. Each of these emulsions was then thoroughly washed in water, and the plates were coated. Of these plates, in each case, one was plunged into a bichromate bath for four hours, and the other for eighteen hours, and then both placed in running water for six hours. Although after this treatment a careful chemical analysis showed no trace of chromates, the plates were further washed for thirty hours in running water. All the plates were then dried, and exposed under the scale-photometer by gas-light for sixty seconds, and subsequently developed each for the same space of time with ferrous oxalate. The results were as follows:—

	Visible degrees of the photometer (after fixing).
a. Uncooked emulsion	13
b. Do. treated with bichromate	7
c. Emulsion boiled for half an hour	19-20
d. Do. treated with bichromate ...	13
e. Emulsion boiled for 1½ hours, (highly fogged)...	2
f. Do. treated with bichromate (not so much fogged)...	8

These experiments were repeated several times with the same results, and we conclude from them that—

1. By treatment with bichromate the sensitiveness of silver bromide is diminished, both in the case of cooked and uncooked emulsion, though both, after a less or more time, work perfectly clear. We cannot refer the action of the bichromate to traces of the residual salt, but it must

---

[*] *Photographische Correspondenz.*

[*] PHOTOGRAPHIC NEWS for 4th February, 1881, p. 53.

[†] "Emulsification by Daylight." PHOTOGRAPHIC NEWS for 11th of Feb., 1881, p. 61.

be assumed that the silver bromide itself undergoes some change, which is quite stable after the whole of the salt has been completely removed.

2. A highly sensitive emulsion obtained by boiling for half-an-hour is reduced, after treatment with bichromate, in sensitiveness to that of an uncooked emulsion.

3. An emulsion which fogs very strongly in consequence of being boiled three times as long as is necessary to produce a highly sensitive emulsion is doubtless improved by treatment with bichromate, although the fog is not quite destroyed. As regards sensitiveness, it is not in this case greater than that of an emulsion cooked only for a short time, and then treated before any fog makes its appearance. On the contrary, an emulsion boiled continuously until it fogs, and then treated with bichromate, is much less sensitive than that last mentioned, and even (at least, in our experiments) less sensitive than one not submitted at all to heating.

When our experiments were concluded, our attention was drawn to a letter by Mr. Sawyer in the Photographic News for the 18th February, 1881, p. 84. According to this observer a gelatino-bromide emulsion, after cooking for about forty minutes, is about ten times as sensitive as a wet collodion plate; but, after treatment with bichromate, its sensitiveness is only equal to that of the latter. On the other hand, the editor of the *Photographisches Wochenblatt* (February 1881, p. 62) remarks that the recovery of a foggy emulsion by means of bichromate has often been found to be successful. These statements agree generally with our own observations.

(*To be continued.*)

ARGENTIC GELATINO-BROMIDE PAPER.

BY W. T. MORGAN.*

In response to your kind invitation I have attended, with my partner, Mr. Kidd, for the purpose of showing specimens, offering a few remarks, and developing an enlarged picture on our argentic gelatino-bromide paper.

Enlarging is generally an interesting process; whether it be enlarging one's house, one's lands, knowledge, or pocket, it is always suggestive of advancement. But the process we are here to-night to advocate will be found more interesting to most of my hearers—namely, the enlargement of the photographic image.

As long as I can remember the photographic profession, a knowledge of about twenty-five years, enlarging has always been the source of much discussion. Processes and plans innumerable have been suggested. We have had patented processes, secret processes, exclusive licence processes, ten-pounders, fifty-pounders, and I am told that as much as £250 have been paid for an enlarging process. Each one has, of course, been put forward as so much better than its predecessor, following the old proverb that "Every crow thinks its own chick the blackest." Now we, of course, think our chick blacker than any that have gone before it.

Many attempts have been made to produce life-size pictures direct, but with little success; the cost is too great, the labour too severe, and the result too ugly to command approval. I have for years held, and still hold, to the opinion (notwithstanding the undoubted advantages of gelatine plates) that large direct pictures—say, beyond 12 by 10—whether they be landscape or portrait, are, as a rule, unprofitable to the professional man. As proof of this opinion, so few continue to produce them. We have seen ambitious men whose minds were bent on doing something big and distinguishing themselves, struggling with ponderous apparatus, cameras as large as chests of drawers, lenses as large as beer barrels; they have enlarged their studios, their dark-rooms, and everything about them; but the end of it has always been, instead of an enlarging, a diminishing process. It has usually diminished their pride as well as their pockets; they could get nothing out of it but a large development of bad temper, so the big lenses have become so much lumber, and the cameras an eyesore. Then, in some quarters, sprang up a mania in another direction for pocket cameras, and postage stamp negatives were the order of the day, to be afterwards enlarged to ponderous dimensions. But enlarging by the old method from small negatives was so unsatisfactory that they required a great deal of working up by the artist—so much so, indeed, that they had lost their character as photographs by the time they had become pictures.

By the time the enlargement has passed through its various stages, most of the beauty of the original has been lost. What has always been wanted is that which we claim to have satisfactorily accomplished—that is, a very simple and certain method of producing an enlargement of almost any dimensions direct from a small negative at one operation. The collodion transfer does this to a certain extent; but, as a rule, it is very troublesome and very unsatisfactory, and will not at any time pass muster for first-class work.

As I before mentioned, there are so many difficulties attending the production of first-class enlargements by the old method that it has become almost a distinct branch of the photographic profession, and many photographers prefer to put their enlargements out to be done, and whilst their own assistants are standing idle, they have to wait the convenience of other people. This, I maintain, is not as it should be. I think it a very great mistake to send anything out to be done that could, or should, be as well done at home. Very good enlargements, I know, can be obtained at certain establishments, but they are very expensive. There is a great delay in their production, and great risk in sending the negatives any distance. They are nearly always wanted in a hurry, and in our own business we have lost many important orders in consequence of the length of time they have been kept on hand.

Within the last few months, since using the Argentic paper in our own establishment, we have made several most profitable captures in the way of orders of enlargements. We can do them now at so much more reasonable a figure than hitherto, and if any of our sitters but breathe the slightest suspicion of requiring an enlargement, I give the hint to my assistant, and while I keep them in conversation for a few minutes, the enlargement is produced, completely finished in a dish of clean water (where prints always look their best), and we seldom fail to elicit an order.

With the introduction of this paper the whole system of enlarging is changed; it is so much more easy to produce a more satisfactory result. The paper may be kept in stock always ready at any moment. It is so sensitive that enlargements may be done during the dull days when it is impossible to take a negative; when nothing else can be done they may be taken in hand. An ordinary paraffin lamp is all the light required for most purposes, and if it so happens that you have no time to carry the process through, never mind, expose to-day, develop to-morrow, or next week, or next year, if you please. The paper is so very accommodating that it will suit your convenience; you have only to keep it from the light and damp; or if a number of copies from one subject be required, expose the lot, one after another, until they have all been impressed with light, and then put them away in a suitable place, and develop them at your convenience.

It so frequently happens in the course of business that customers require one or two cabinets from carte negatives, or from any negative a size or two larger than they have been taken direct; this cannot be done by the old method; they are not presentable as plain pictures, the delay is great, the price that must be charged is prohibitive, and the result is, as a rule, unsatisfactory. Amongst the specimens here shown are eight cabinets, enlarged from a carte, on one piece of paper at one operation, and the whole produced, from beginning to end, in about ten minutes. We have in several instances produced a life-sized enlargement successfully entirely in the presence of the sitter. This lends additional interest to the productions, and, as it can be done at so trifling a cost, it is usually a profitable transaction. The manipulations are so clean that one need not soil his fingers, and this is no small advantage over the old method.

We have had many enquiries respecting their tone and permanency—whether we could not get them the photographic brown. Our reply is, that for enlargements—and that is what we are especially recommending it for—the fine rich black as shown in the specimens exhibited here is, we consider, all that could be desired; they are less like the old stereotyped photographic tint, and when produced from a good negative it would be difficult for the most practised eye to decide whether or not they had been worked upon with black and white. We have now sent out a good number of various styles and sizes, and in no single instance has the tone been objected to. With regard to their permanency, we believe them to be absolutely permanent; we have put them to many severe tests with most satisfactory re sults. I may remark that about eight years ago we made a series of experiments with this paper, but could not produce satisfactory results. Neutral oxalate of potash was not then known as a developer, and pyrogallic acid will not answer the purpose, so it was for the time abandoned. A short time ago, on turning out an old cupboard, we came across one of our earliest experiments, and although it was at the time very imperfectly washed, yet it appeared as perfect as on the day it was made.

---

* Read before the South London Photographic Society.

Notwithstanding its extreme simplicity, we have had complaints that some have not succeeded to their entire satisfaction; but in every case that we have enquired into we have found they have not followed out the very simple instructions sent with each parcel of paper: they have not used the neutral oxalate ot potash, but some other compound that the nearest chemist has thought would do quite as well; they have not used boiling water to obtain saturated solutions; have omitted using the acid bath, or have left undone something they ought to have done, or have done something they ought not to have done; they will not follow our simple instructions, but will do things their own way.

We will now proceed with the more interesting part of our programme, and, as promised, will make a print by contact with the negative; also an enlargement life-size on a sheet of paper 30 by 22. But, ere I conclude, I venture to make one prediction, and that is that gelatine bromide will make as great a change in the production of the positive photograph as it has already done in the production of the negative.

Correspondence.

REMEDY FOR FRILLING.

Sir,—I send you a remedy for frilling in gelatine negatives given me as *bôna fide* by a professional friend. I have not yet had a chance to try it myself, but hope it may be of use. It is simply to put the plates, before using, in an oven and bake them.—I am, sir, yours, &c.,

Amateur.

INTENSIFYING DRY PLATES.

Sir,—I have for some time used, and found very successful, an old wet plate formula for intensifying dry plates. After the negative has been in alum twelve hours, I use iodine, and then pyrogallic and silver. Sometimes only iodine is used. Enclosed is a print from one of the negatives.—Yours, &c., F. Simons.

Proceedings of Societies.

South London Photographic Society.

A meeting of the above Society was held on Thursday last, April 7th, at the Society of Arts, the chair being occupied by the Rev. F. F. Statham.

The minutes of the preceding meeting having been read and confirmed, Messrs. T. H. Ellerbeck, J. Winter, and H. Plaister were duly elected members.

The Chairman said that, unfortunately, the large room usually used by the Society was occupied that evening, and so they had to meet in the smaller room; and he was rather afraid that a good many would be unable to see with any degree of comfort, the room being so densely packed; but as no other arrangements could be made, they would have to do the best they could under the circumstances.

The President then proceeded to distribute the medal and diplomas awarded in last year's artistic competition. The medal was of silver, and engraved with the name of the recipient, Mr. F. Hollyer. The diplomas were handsomely lithographed, the name of the recipient and title of his picture being filled in, and the whole signed by the three artists, the President, and the Secretary of the Society. The diplomas were given to Mr. F. Hollyer, Mr. Adam Diston, and Mr. C. J. Eames.

The Chairman then called upon Mr. Baker (Stewart and Co., Strand), who exhibited, by means of a new triple lantern, the various lenses for the lantern.

Mr. Baker entered at some length into the different lenses and condensers suitable for the lantern, and exhibited a map of London with Dallmeyer No. 1B portrait lens, the same picture being shown with Dallmeyer's patent lantern lens, and also with a new cheap lantern lens manufactured by Mr. Stewart. The opinion of the meeting was decidedly in favour of Dallmeyer's patent lantern lens, as giving the most light and best definition.

Mr. York said that the No. 1B was in most photographers' hands, and it was as well to know that it would answer so satisfactorily for the lantern.

Mr. Baker also showed several slides, using a new revolving curtain, the effect certainly being very good. A new triple dissolver, by Otteway, was passed round.

Mr. W. C. Hughes showed his new lantern for burning paraffin, the lamps being placed one over the other. Owing to the apparatus not being placed high enough, the image appeared very low on the screen; but the result was very satisfactory.

The Chairman said that, as they had some other matter to lay before the meeting, the lantern matter must terminate; although several other things had to be shown, including the sciopticon, and also a lantern sent by Mr. Wilkinson, of Sunderland. Perhaps, at the next meeting, arrangements could be made to continue the exhibition.

The Chairman then called upon Mr. W. T. Morgan to demonstrate his new gelatino-bromide paper.

Mr. Morgan, before proceeding to make an enlargement, made a few remarks on enlargements in general, stating that by the ordinary rules of enlarging a great many good points of the small negatives were lost by having to make a transparency, and then a negative, and, finally, from that, a print; whereas, by using gelatino-bromide paper, the enlargements were made direct on to the paper. Another great point was that the surface was so very superior to work upon to either carbon or silver. Mr. Morgan said he did not advocate the use of the paper so much for printing direct as for enlargements, although, in cases where a large quantity had to be printed, or a proof got at once, it was invaluable. Mr. Morgan said his partner (Mr. Kidd) would first print one by contact. Mr. Kidd proceeded to do so, and gave an exposure of twelve seconds by a paraffin lamp, the result being passed round to the members. Mr. Kidd then proceeded to make an enlargement on an imperial sheet of paper, size 30 by 22, from a C.D.V. negative, Mr. Morgan describing the apparatus. This was most simple, consisting of an ordinary tin biscuit box, in which was placed a paraffin lamp burning a round wick; in front of this was placed a condenser; and again in front of this, a part of an old camera containing the lens; by covering the end of the biscuit tin with ruby paper, a developing light would also be made, thus having camera and developing light all in one. The enlargement was made with an exposure of six minutes, and developed with a saturated solution of neutral oxalate of potash and protosulphate of iron, 6 parts of the former to 1 of the latter, and a few drops of a 60-grain solution of bromide of potassium.

Several questions were asked and answered by Mr. Morgan.

Several specimens were exhibited, and caused a great deal of interest, the life-sized heads being exceedingly fine, the colour being a rich black, and requiring little or no working up; altogether, Mr. Morgan is to be congratulated upon the success of his demonstration, and the interest it created.

The Chairman then announced that a paper sent by Mr. Croughton would be postponed till the next meeting. He also announced that the subjects for the Artistic Competition for April and May would be "A Quiet Corner" and "Landscape, with Mill."

A vote of thanks having been passed to the several gentlemen who had contributed, the meeting adjourned.

Sheffield Photographic Society.

The ordinary monthly meeting was held at Freemasons' Hall, April 5th, Dr. Morton (President) in the chair. The minutes of last meeting were read and confirmed.

It was arranged that the first excursion of the season should be to Wingfield Manor, on May 5th.

Messrs. Rawson, Dickenson, and Hadfield were elected members of the Society.

The Secretary read a letter from Mr. W. H. Warner, Bristol. It was proposed by Mr. J. D. Leader, and seconded by Mr. T. Firth, that the questions asked by Mr. Warner be discussed and answered at the next meeting.

Mr. Yates exhibited an ingenious lantern with canary medium, suitable for changing or developing plates.

Mr. **Dakin** also showed one for a similar object.

The **President** brought a lantern universal, for the purpose of testing its capabilities, and also of comparing transparencies made by different methods.

The members having been invited by circular to bring slides, Messrs. Strongfellow, Dakin, Stacey, Holladay, and the Secretary contributed.

Dr. **Morton** remarked, in reference to lantern slides, that the first consideration was to ascertain the best process of making them, so that the picture should be both permanent and artistically beautiful. It was still a question whether wet or dry collodion, carbon tissue, &c., was the most suitable; certainly, good results were obtained by the wet collodion and silver, intensified by mercuric chloride; but some doubts had been expressed regarding their durability. The carbon transfer left little to be desired; but occasionally there was irregularity in printing. He (the President) hoped the members would give their opinions on the subject.

The pictures—principally from collodion and carbon slides—were projected upon the screen. Owing to the lateness of the hour, the discussion was limited.

The meeting then adjourned.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting was held as usual at the Museum, Queen's Road, on Wednesday, the 6th inst., Mr. **Powell** in the chair.

The minutes having been passed, Mr. Sampson, was elected an ordinary member of the Association.

The **Chairman** then called upon Mr. H. A. H. Daniel to introduce the subject of instantaneous shutters.

Mr. H. A. H. **Daniel** thought that the photographic season being about to open, the consideration of instantaneous shutters might interest the members generally, and he was glad to say that he had succeeded in being able to have six different kinds on the table for inspection by the members. He would, therefore, take them one after the other, and endeavour to explain their modes of use and their various advantages, at the same time trying to keep clear of anything like invidious comparisons, or giving any opinion on them respectively. The ordinary "Drop Shutter" (1) was purchased from Messrs. Wratten and Wainwright, and worked in front of the lens; its construction was very simple, and for many classes of subject answered very well; the variations of exposure were arranged by altering the size of the opening, and not by changing the speed of its passage in front of the lens. Its advantages were lightness, portability, and inexpensiveness. The next he would show them (2) was one similar to the foregoing one, with the addition of the release of the shutter being accomplished by pressing a pneumatic ball. Advantages: similar to the previous one, with the addition of immunity from possibility of vibration through actual contact with the hand. Messrs. Hunter and Sands' (3) was an exceedingly good shutter, and, strange to say, the only one of the lot working between the lenses. It was a very ingenious idea, and, although the operator's hand was in actual contact the whole time of the exposure, that good work could be done with it was evinced by the inventors being awarded a medal for their instantaneous pictures at the Bristol International Exhibition in December last. Advantages: can be used for long or instantaneous exposures, is very portable, and very inexpensive. Cadett's Shutter (4) the speaker characterised as a very cleverly designed instrument. Although appearing at first sight a little complicated, it was in reality nothing of the kind, being, after a few minutes' quiet inspection, as simple as possible. It worked with exposures varying from one-hundredth of a second (tested) to an exposure as long as one liked; its position was in front of the lens, the shape of the opening so made as to give the foreground the longest exposure, or, if necessary, *vice versa*. The graduated scale was very useful indeed, showing the relative degrees of rapidity of exposure. The india-rubber tube and pneumatic release of the shutter enabled the photographer to study the effects of light, or lulls between wind, &c., without any interruption caused by turning to the camera to use a cap. A very convenient place to carry it was on the lens, when screwed into the camera on the inside. Advantages: delicacy and accuracy of adjustment, suitability for very rapid or long exposures, and affording great freedom from distraction when watching for effects. Chadwick's instantaneous view shutter (5). A very ingenious and efficient piece of apparatus; also used in front of the lens with a pneumatic ball, somewhat similar to Cadett's; but for instantaneous exposures only. Advantages: great portability, extreme rapidity, and lightness; likewise the advantages connected with tube and pneumatic balls. The speaker said he would introduce last (but not least) the clever shutter of Mr. S. P. Jackson, formerly a fellow citizen of many present, but now at Henley-on-Thames. It was very ingenious in style, the principle being the same as Messrs. Hunter and Sands' in the matter of the crossing of two openings simultaneously; the famous pictures of the "Swans" and "Flying Dutchman" were done with it (a number of instantaneous river and skating scenes taken with it were handed round for inspection). Mr. Daniel considered it a very excellent shutter, but would recommend its being made almost entirely of ebonite, the metal work being also very much lighter; the speaker suggested a method by which the principle would be quite preserved, although occupying only half its present space. Advantages: great rapidity, simplicity, and capability of use for either instantaneous or long exposure. Mr. Daniel said that it would be observed that three of the six could be used for either long or very instantaneous exposures, and three could not; and that the first three were undoubtedly very convenient shutters; that five worked in front of the lens, and one between them, although he could not help saying that he paid very little attention to that, if the opening be of the correct shape; many considered it a great point, but he looked at results, which, after all, were the great tests, and practically one found no difference. Messrs. Marsh's "Flying Dutchman" was taken with a shutter in front of the lens, and Messrs. Hunter and Sands' yachting scenes were taken with a shutter between the lenses, and both were equally and beautifully sharp. He desired to thank Messrs. Hunter and Sands, Messrs. Marion, Mr. Husband, and Mr. S. P. Jackson for kindly forwarding shutters to aid his remarks.

Mr. **Brightman** said that in the simple "drop shutter" it was a great convenience to move the trigger releasing the shutter with a fairly long piece of silk cord.

The **Chairman** said that Mr. York, of London, very ingeniously used a kind of elongated diaphragm as an instantaneous shutter, the diaphragm sliding though the lens with its own weight, these having a slit in the under part of the lens for it to slip through, and a little bag preventing its falling out.

Mr. H. A. H. **Daniel** desired to apologise for appearing to monopolise so much of the time of the meeting, but he would propose (as per the notice sent to all the members): "The institution of four bronze medal awards for the best realisation and conception of ideal subjects, the titles to be given out at the May meeting, the pictures to be sent to the honorary secretary not later than the 15th of October, and the awards to be announced at the November meeting."

A schedule of rules for the competition was then decided upon, the motion having been most unanimously carried. This closed the proceedings.

Photographers' Benevolent Association.

The Board of Management held the usual monthly meeting on 6th inst. at 181, Aldersgate Street. The minutes of the previous meeting having been read and confirmed, the Secretary stated that Mr. C. G. Cutchey (Hon. Sec. of the Photographic Club, under the auspices of which a soiree has been held in aid of the Benevolent Association) had informed him that the undertaking had resulted in the addition of £11 17s. 3d. to the funds of the Association.

The following resolution was carried unanimously:—

"The Board of Management beg to offer their most sincere and hearty thanks to those members of the Photographic Club and friends who have shown so much kindness and rendered such material assistance to the Benevolent Association, by giving a concert and ball on 9th of February last in aid of the funds of the said Association. The Board feel the more pleasure in doing this, inasmuch as it was so entirely spontaneous on the part of the Club and friends, and was an unlooked-for and most agreeable surprise to the Photographers' Benevolent Association."

Messrs. Hunt, Carrolo, Grant, and Wood, were duly elected members of the Association.

The meeting then adjourned till May 4th.

Photographic Society of Ireland.

A meeting was held in the Royal College of Science, on Friday, the 8th inst., Mr. J. E. **Madden** presiding.

The minutes of the previous meeting having been read and confirmed, two names were proposed for election at next meeting.

Mr. E. P. Johnstone read a paper on his method of preparing gelatino-bromide plates, and his varied experiences with the formulæ of Captain Abuey and Dr. Eder. He showed a collection of negatives and prints to illustrate the different results obtained, also a drop-shutter to which he had fitted a pneumatic piston, which released the shutter at the desired moment without vibration.

Mr. Thomas Mayne, T.C., read an exhaustive paper, "On the Preparation of Gelatine Transparencies for the Lantern or Other Purposes" (see p. 172). He clearly demonstrated that the usual veil in such work can be completely obviated by the methods which he proposed. As an illustration of his paper he showed in the lantern a collection of positives, which left nothing to be desired.

Mr. J. V. Robinson drew the attention of the meeting to the use of alumano citric acid—strength, one ounce citric acid to one pint saturated solution of alum—which completely removed all yellow stain, even from old gelatine negatives, giving them the colour, clearness, and sparkle of wet plates, and enormously enhancing their printing qualities.

Votes of thanks having been passed to Messrs. Johnstone, Mayne, and Robinson for their interesting communications, the meeting adjourned.

Dundee and East of Scotland Photographic Association.

The first annual meeting of this Association was held in Lamh's Hotel on Thursday evening, April 7th, Mr. James C. Cox, president, in the chair.

There was a good attendance. The Hon. Secretary read the minutes of the last meeting, which were approved and confirmed. Five gentleman were elected members, viz.:—Messrs. John Thomson, John Logan, John Leadbetter, John Nairu, and D. Ireland.

The Secretary's annual report, together with the treasurer's and auditor's statement, having been printed, were taken as read.

The President, in his address, said that sudden and early death was the fate predicted for the Association by some of its friends, but it still lived and increased in vigour. The Secretary's report must be gratifying to them all from the clear and full manner in which he had recounted the year's doings. In congratulating the members on the season's work, the President moved a vote of thanks to Mr. Johnson. The treasurer's balance sheet showed that their financial elements were in a happy state, and he also moved a vote of thanks to Mr. Tannahill, and to the auditors, Messrs. Robertson and Baxter. He then said the forthcoming season of this as yet short-lived Association would be an eventful one, as it had undertaken to hold an exhibition open to Great Britain and Ireland, an undertaking which most of the elder societies would shrink from. They should do their very utmost, and with a long pull, a strong pull, and a pull all together, they would carry the exhibition through not only successfully, but to their credit, and to the approbation of all their exhibitors, if possible. They trusted to Lord Strathmore continuing to honour them by remaining their patron, and as regarded himself, he had to thank the Council and all members for their forbearance, and for the courtesy he had received.

The office-bearers were then duly elected for the ensuing year as follows:—

President—Mr. J. C. Cox.

Vice-Presidents—Mr. W. D. Valentine and Mr. J. Robertson.

Secretary—Mr. C. Johnson.

Treasurer—Mr. W. G. Tannahill.

Council—Messrs. G. D. Valentine, A. Donald, R. S. Baxter, G. F. Roger, H. G. Fraser, and G. D. Macdougald.

An Exhibition Committee was then appointed, to consist of the present council, and six members added, viz.:—Messrs. John Geddes, John Henderson, Maguus Jackson, D. Ireland, J. N. Davidsou, and S. Rollo, with power to add to their number.

A comparison of the result of the electric light experiment was afterwards made, and excellent pictures were shown by Messrs. John Goddes, Donald, C. Johnson, and others.

It was decided to hold the annual outdoor meeting on the 16th of June, and Mr. Cox gave a kind invitation to visit his father's estate at the Trossachs, which was accepted by acclamations.

The Secretary called attention to a magnificently bound portfolio, the gift of the President, and also to a handsome album, presented by Messrs. Valentine, which lay upon the table, and proposed a vote of thanks to the donors. The portfolio is a splendid book, and reflects great credit on Mr. W. Kidd

A vote of thanks to Chairman brought the meeting to a close

To Correspondents.

⁂ A cheque for two guineas will be given for the best practical essay "How I keep My Books," by a Lady. The following rules must be noted:—The article should be from one to two columns in length; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st May, marked outside, "How I Keep My Books." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected M.S. In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final.* The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

Barium.—1.—The lens you mention will serve your purpose very well indeed as regards the half-plate pictures, but when used for quarter-plates it will naturally include a smaller angle of view. 2. The firm you mention is very respectable, but the difference of price between a new lens and a second-hand one is likely to be so small as not to pay for the risk of anything being wrong.

F. G. Smith.—If you cannot construct the camera without special instruction, you would not be able to do so after reading an article on the subject. Look at one when you get an opportunity; or, if possible, borrow one, and copy exactly. In camera-making, as in watch-making, a great deal depends on having the special tools which are made for the work.

A. J. B.—The coating on the double transfer paper is so slightly tanned with chrome alum as to allow the gelatine to become soft and adhesive when placed in warm water; while the single transfer is coated with gelatine which has been rendered almost completely insoluble. If you attempt to develop a print on double transfer paper, the softening of the film gives rise to a very peculiar vermicular reticulation. If you render the coating on ordinary albumenised paper insoluble by floating for a few seconds on methylated spirit, it can be used as a single transfer paper.

C. D. E.—The matter is beyond the province of the Photographic News.

W. G. H.—Under the circumstances, iodide of lead would be precipitated. Although it has a very fine colour, it is not adapted for use as a pigment; and, moreover, it is too expensive.

C. Reid.—Grind up a little lamp-black with ordinary negative varnish, and slightly warm the metal before applying it.

S. Hyams.—1. It is now sold by most opticians and dealers in scientific goods. 2. We believe about 6s. per lb.

H. Dages.—Never having heard of them, we do not think anything about them. Have you not made some mistake in your question?

G. Slaide.—We are inclined to think that a trace of grease is the cause. This may have been present in the gelatine originally.

Mentor.—You have evidently made a considerable mistake, as sulphate of lead is readily soluble in a solution of caustic soda.

L. M. Matthews.—Your system of lighting is very crude. In the first place, shade off the top light, and note the effect of this change. Afterwards you can work on the side lights. It is a very good plan to take a well-lighted portrait as a copy, and to strive to imitate it.

Country Barber.—You should hardly look for a royal road to excellence in photography. Although it is easy to acquire a certain amount of manipulative skill and technical perfection, the art aspects of the subject require careful and patient study. Practice, thought, and careful reading of the News and Year-Books are what you require.

Theo. Boxer (Bedford).—Situated as you are, it would be much better for you to purchase the material ready made, considerable experience being necessary for the production of an article uniform in quality.

L. P. L.—Calcium carbonate is notably soluble in an aqueous solution of carbonic acid; hence the phenomenon which appeared so incomprehensible to you.

Anxious.—The damage to the lens will do no further mischief than reducing the amount of light, but the injured part must be painted over with some opaque material, such as black varnish.

Never Despair.—Heat it to redness for a few seconds.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1181.—*April* 22, 1881.

CONTENTS.

PAGE
Developing Pictures on Gelatino-Chloride Emulsion.............. 181
The Preservation of Negatives 182
Bichromate of Potash in the Gelatino-Bromide Process. By Dr. J. M. Eder and Captain Pizzighelli........................... 182
A New Method of Eliminating Fog on Gelatino-Bromide Plates, with Some Remarks on Dr. Kenyon's Method of Preparing Bromide Emulsion. By Dr. J. M. Eder 183
By-the-Bye—"Articles de Paris" 184
Notes 185
Topics of the Day—Modern Cyanotype Printing. By Dr. J. M. Eder 186

PAGE
French Correspondence. By Leon Vidal............................ 186
Southward Ho! or, Easter Monday By a "Special Correspondent".. .. 187
A New Clearing Solution for Gelatine Plates. By John Cowell 188
An Improved Method of Washing Gelatine Emulsion. By J. M. Turnbull 189
Photo-Micrography. By George E. Davis, F.R.M.S............. 190
Correspondence 191
Proceedings of Societies 191
To Correspondents 192
Local Patents 192

21481

DEVELOPING PICTURES ON GELATINO-CHLORIDE EMULSION.

For nearly twenty years photographers have occupied themselves with the preparation of silver bromide emulsions, and with the discovery of the best means of developing pictures on them. Meanwhile, the development of photographs on silver chloride has been quite neglected. Anyone who develops a picture on silver chloride will probably do so with the pyrogallic developer, which was used forty years ago.

The question is, how does silver chloride behave with the so-called chemical developers? Can we not, by employing it, effect as great an improvement in photography as was introduced by the chemical development of silver bromide with alkaline pyrogallic and ferrous oxalate? So long ago as the year 1867, Russell experimented with his alkaline developer on collodio-chloride, but without satisfactory results, inasmuch as the plates fogged very quickly. More recently, Berkeley has turned his attention to this subject, and has used hydrosulphite as a developer. His experiments we have several times referred to in this journal. The complete investigation of the subject has been reserved for Dr. Eder and Capt. Pizzighelli, who have laid before the Imperial Academy of Sciences of Vienna a short account of their researches.

The following are the questions which these gentlemen propose to themselves, and the results which they obtained:—

1. How shall we prepare silver chloride plates which can be developed chemically? Both with collodion emulsion and with gelatine emulsion; the latter is the more sensitive of the two, and develops purer and clearer. Gelatino-chloride emulsion must contain an excess of soluble chloride. It is prepared similarly to gelatino-bromide, by mixing two solutions—a solution of 25 parts gelatine, 7 parts sodium chloride (or the corresponding quantity of ammonium chloride), and 200 parts of water; and a solution of 15 grains silver nitrate, and 100 grains water. The authors describe the action of ammonia on the chloride emulsion as very satisfactory; it converts the finely-divided pulverulent modification of silver chloride into the finely-divided granular modification which transmits the blue rays. This change is also effected by digesting at a high temperature, without the use of ammonia, so that the chloride behaves in this respect in an analogous manner to the bromide.

2. What reducing substances are, in a liquid state, best adapted for the chemical development of images on silver chloride? As a rule, silver chloride is more readily reduced to the metallic state than the bromide; hence energetic developers (alkaline pyrogallic, ferrous oxalate, hydroquinone, caustic ammonia), which render such good service with silver bromide, are not fitted for use with silver chloride, as they cause fogging, and, in a concentrated state, blacken the entire plate. Even hydrosulphite was found by Eder and Pizzighelli to act too powerfully. We will, however, not discuss further the substances which are not so well adapted for this particular kind of development, but will at once state what these gentlemen have discovered to be the best developer for silver chloride plates, namely, the so-called ammonio-ferrous citrate, that is, the double salt obtained by the action of citric acid on ferrous oxide and an excess of ammonia; it is prepared by mixing a solution of ferrous sulphate with one of ammonium citrate.

Now in the correct preparation of this solution lies the secret of success, and the discovery of this developer in its peculiar form is the result of a long series of experiments undertaken by the discoverers. Much depends on the degree of concentration, on the proportion of citric acid, on the relation of the iron to the ammonium salt; we therefore reproduce the formula as directed in the above-named note in the Transactions of the Academy. 600 grains of citric acid are dissolved with the aid of heat in 2 litres of water, and neutralised with ammonia; 400 grains of citric acid are then added, and afterwards as much water as will bring the volume of the whole up to 4 litres. Of this solution 90 cub. cents. are mixed with 30 cub. cents. of cold saturated solution of ferrous sulphate and 6 cubic cents. of a solution of sodium chloride, which contains one part of the salt in thirty of water.

Hydrokinone with ammonium carbonate gives another excellent developer, after the formula: 150 cub. cents. of water, 0·3 grains of hydrokinone, 0·6 grains of sodium chloride, and 1 grain ammonium carbonate; this developer necessitates about three times as long an exposure as when the ferrous citrate is used. Silver chloride plates may also be developed by means of a pure neutral solution (containing from ½ to 1 per cent.) of pyrogallic acid. Silver chloride with chemical development is less sensitive than silver bromide chemically developed; for instance, gelatino-chloride developed with ferrous citrate must be exposed fifty times as long as gelatino-bromide developed with ferrous oxalate.

It is a remarkable fact that the silver chloride gives quite differently coloured images, according to the method of its preparation and development, depending on the molecular distribution of the reduced silver. Pictures varying through all the shades may be obtained—black or dark grey, dark brown, olive brown, sepia brown, yellow brown, red brown, purple red, and light red—a phenomenon which cannot be produced with silver bromide. In the Vienna Photographic Exhibition, Messrs. Eder and Pizzighelli showed a large number of transparent positives of this kind.

The exact method of obtaining these various shades has not as yet been made public, but the following directions give a very good idea of the subject. (*a*). Silver nitrate with ammonia, as well as silver chloride which has been cooked in water for a long time, produce darker colours (dark brown or violet black) than ordinary pure chloride, which gives a light brown or light red tint. (*b*). The ferrous citrate developer renders on common chloride a reddish brown, on the modified form of the salt metallic silver of a brownish black colour. (*c*). Hydrokinone and ammonium carbonate produce red to violet red tints. (*d*). Pyrogallol, as also gallic acid and ammonium carbonate, give brown coloured silver. (*e*). A chloride which has been exposed for a short time and developed slowly produces dark-coloured metallic silver, but if exposed for a long time and developed quickly it is reduced to silver of a light tint. (*f*). If a little of the solution of gallic acid in alcohol (1 and 10) be added to the above-mentioned ammonia-ferrous citrate, the colour of the image obtained will be a beautiful olive brown.

The image is fixed by means of a weak solution of hyposulphite. It can be toned in a solution of gold, but this operation is not necessary. A dilute solution of rhodammonium with a little hyposulphite makes a very good toning bath, but a pure and strong rhodium bath acts too energetically, and causes the image to assume a blue tint, which is no improvement.

According to Eder and Pizzighelli, the gelatino-chloride process cannot be used with advantage in taking negatives, but it is very well adapted for the production of transparencies, the reproduction of negatives, for enlargements, for sciopticon slides, &c. The duration of exposure under an ordinary negative need only be from two to five seconds, while in the carbon process it takes many hours; by gaslight the exposure will require to be much longer, from twenty to thirty minutes.

THE PRESERVATION OF NEGATIVES.

So much has been said and written regarding the instability of silver prints, that any photographer who has kept himself fairly posted up in everyday themes may be expected to merely exclaim, "Ah, just so;" or, "Rather sooner than I expected," on opening his album and finding a much-prized picture sinking into mottled yellowness.

In all probability our friend does not take matters quite so philosophically when he goes to the store to fetch the negative, in order to make a fresh print, and finds that the film has split up into small and irregular pieces, separated by lines of clean glass, the whole recalling the idea of a negative representing a demon-stained glass window, having very narrow and very irregular sash-bars.

The primary cause of the destructive action in question is a tendency on the part of the varnish to contract rapidly; as, for example, when a negative is subjected to a sudden alternation from heat to cold. In such a case, the film breaks up rather than slide over the glass to the necessary extent; but had the alternation of temperature been slower, either the film might have slipped to the necessary extent, or a small degree of viscosity on the part of the varnish might have resulted in the straining or stretching of the film so far as to prevent rupture. It not unfrequently happens that a sudden rise of temperature causes the varnished film to break up into a multitude of small fragments, just as happens when the negative is subjected to a rapid fall in temperature; but in the case at present under consideration the mischief arises from the fact of the rapidly expanding film not having time to slide on the glass, or to enable the varnish to thicken up rather than pucker into a series of extremely brittle arches.

The tendency of the film to crack may be entirely obviated by making use of a varnish which permanently retains a moderate degree of viscosity; but such a varnish is subject to the disadvantage of being liable to become tacky or soft when exposed to the heat of a summer sun.

Another circumstance which tends to give security is the firm fixing of the film to the glass, this being effected by the aid of an albumen substratum. In such a case, all sliding motion of the film is prevented, and the varnish must perforce expand as regards thickness only, except so far as it may expand with the glass plate. It need scarcely be mentioned that any trace of moisture remaining in the collodion film tends towards destruction, and the imperfect removal of hyposulphite is accompanied by a corresponding difficulty as regards the perfect drying of the collodion; hence one reason for the thorough washing of negatives after fixation.

In order to diminish the chance of negative films becoming broken up into small patches, it is important that the plates be preserved in a dry place, which is not subject to sudden changes of temperature; a cellar being, as a rule, satisfactory with regard to the last mentioned condition, while dryness may generally be ensured by packing the negatives in tin boxes.

With respect to remedies for the cracking of the film after the mischief has taken place, two may be mentioned. When the negative is covered over with a network of hair-like transparent lines, the best way is to gently rub powdered plumbago over the surface, this material entering into the grooves, and serving to so far shade the transparent lines as to enable a fairly good print to be obtained in most cases. If, on the other hand, the film has become damaged from expansion, in such a way that the separate pieces oversail each other, or the plate is covered with innumerable arch-like wrinkles, matters can generally be put right by first thoroughly softening the varnish with the vapour of hot alcohol, and then removing the softened resinous matter by means of abundant ablutions with spirit, after which the plate may be dried and re-varnished.

Gelatino-bromide films are not subject to the same kind of destructive influences as we have alluded to above, the varnish breaking up, and the film remaining intact in most cases. This mischief generally arises from imperfect washing of the plate, from the circumstance of the film not being perfectly dry when varnished, or from damp gaining access to the film after varnishing.

BICHROMATE OF POTASH IN THE GELATINO-BROMIDE PROCESS.

BY DR. J. M. EDER AND CAPTAIN PIZZIGHELLI.[*]

3. *On the Preparation of Duplicate Negatives by Means of Chromated Gelatine Emulsion.*—If a gelatino-bromide plate be exposed under a negative to the point of solarization, and then developed, a sharp but imperfect negative is obtained. Bolas found [†] that this process can be made more complete by soaking the plate for a few minutes in a four per cent. solution of potassium bichromate, then rinsing it for a few seconds in a bath composed of equal volumes of water and alcohol, next drying it, and afterwards exposing it under a negative for three or four minutes in moderate sunshine, or for from ten to fifteen minutes in a good diffused light; after being rinsed, the image is developed with oxalate or with pyrogallic acid. In fact, the reproduction of negatives from negatives is improved by the use of bichromate. Now, Abney's researches show that oxidizing substances, such as bichromate of potash, promote solarization, and hence the more complete results of Bolas's method were referred to a more perfect solarization.

As the result of our own experiments, however, both with gelatino-bromide and gelatino-chloride, we have come to the conclusion that solarization plays a very unimportant part in the process, and that the principal effect is to be attributed to the chromated gelatine becoming insoluble. On a gelatine emulsion plate impregnated with potassium bichromate, and graduated, as regards the degree of exposure, a more or less insoluble image is formed in the colloid; when treated with the developing solution, the latter penetrates only into the unexposed parts, so that it acts unequally on different parts of the image. A negative produced by Bolas's method shows more or less relief, and in some plates the developer is repelled. The following experiments with our new chloride emulsion confirms these views.

---

[*] Continued from page 177.

[†] Photographic News for 25th June, 1880, p. 304.

If a gelatino-chloride plate is soaked in bichromate and exposed under a negative, a positive image becomes plainly visible. When this is developed with the fitting solution—especially with ammonio-ferrous citrate—a negative image is produced; at the same time, the image portions of the gelatine absorb the developer, and swell up. On the contrary, a developing solution, such as ferrous oxalate, which is used for bromide plates, is much too energetic for chromated chloride plates, and is not capable of producing a solarisation image beyond the normal one. Notwithstanding this, however, the fact that a negative image can be developed at all on a chromated chloride plate by means of ferrous oxalate, and without much fog, is the best proof that the developing solution cannot penetrate into the exposed parts. A still further confirmation of our views is afforded by the following experiment:—If a chromated chloride plate is laid, after exposure, in a solution of ferrous sulphate, then rinsed, and transferred to a solution of ammonium citrate, a negative image will also be developed. Similar experiments may be made with bromide plates. We repeat, therefore, our opinion that the preparation of duplicate negatives on chromated bromide or chloride plates is not referable to the effect of solarisation, but to the chromated gelatine becoming insoluble.

4. *Intensifying Gelatino-Bromide Plates with Silver, after Treatment with Potassium Bichromate.*—For the reproduction of drawings, even after intensifying with corrosive sublimate, it is often impossible to produce sufficiently dense negatives. In such cases, we recommend the following process:—A negative which has been intensified with mercury and ammonia, but is not sufficiently intense, should be plunged, as above described, into a bichromate bath, and dried. Now, if this negative is placed in the copying-frame over silvered paper, and exposed until the silver image becomes faintly visible, without the ground changing colour, the parts of the gelatine corresponding to the lines will be found to have become completely insoluble. Those parts which correspond to the dark places of the negative will have been affected close to the glass, but not through and through to the other surface. The negative should now be washed, so as to remove all traces of bichromate, and the intensification with silver can be effected in the following way, with the best result:—An ordinary silver intensifier of the wet process is flowed over the plate, and, after about three minutes, rinsed off again. The image is thus intensified, as in the wet process, by means of pyrogallic acid and silver solution. When necessary, the mercury and pyrogallic intensifiers can be repeatedly used, without our having any cause to fear that the lines of the drawing will become blurred, inasmuch as from the exposure they have lost their power of absorption.

◆

A NEW METHOD OF ELIMINATING FOG ON GELATINO-BROMIDE PLATES, WITH SOME REMARKS ON DR. KENYON'S METHOD OF PREPARING BROMIDE EMULSION.

BY DR. J. M. EDER.

1. Of all the means hitherto proposed for freeing gelatine plates from fog, that invented by Captain Abney is the best. This plan is to bathe the emulsion in a solution of potassium bichromate; the plate will then work quite clear. This method is excellent, provided the fog be not very strong; but if the plates are deeply fogged, it is only partially successful, and enough fog still remains to render the plates useless. For this reason I have been endeavouring to discover a remedy which will act more favourably and energetically than bichromate of potash in destroying fog. The tinctures of iodine and bromine, and a solution of potassium bromide and nitric acid, cannot, for various reasons, be employed in practice; the last-named solution more especially often attacking the gelatine film. I have, however, found that the following mixture acts exceedingly well and rapidly in removing fog:—Ten parts ferricyanide of potassium (acid prussiate of potash) and ten parts potassium or ammonium bromide are dissolved in one hundred parts of water, and the solution is filtered. In this solution the plate from which the fog is to be eliminated is laid for ten or fifteen minutes, and then washed in several waters for at least from one to two hours, until every trace of ferricyanide is removed. To discover whether this has been effectually accomplished, add a small quantity of ferrous sulphate to the last wash water, and observe whether it gives a blue colour. The plates are then dried, and are ready for use.

I must, however, observe that, even after the most careful washing, the sensitivenes of gelatino-bromide plates is very considerably reduced by treating them with this fog-destroying liquid; plates which before the treatment were exceedingly rapid are afterwards found to possess no greater sensitiveness than any uncooked emulsion. But, in any case, it is better to have clear working, even if less sensitive plates, than foggy ones. It must be remembered that, whenever plates are treated with a fog-destroying substance, no matter by what method, their rapidity will be lowered.

The question arises, what is the reaction which takes place when a foggy plate (silver sub-bromide) is treated wtth the solution I have above described? It is manifestly the same reaction which occurs when potassium ferricyanide acts on metallic silver, a reaction for which, so far back as the year 1877, I gave the following equation:—

$$\overset{\text{Potassium Ferrocyanide.}}{2K_6Fe_2Cy_{12}} + \overset{\text{Silver}}{4Ag} = \overset{\text{Potassium Ferrocyanide.}}{3K_4FeCy_6} + \overset{\text{Silver Ferrocyanide.}}{Ag_4FeCy_6}$$

From the silver sub-bromide (Ag_2Br) in the plate, which readily splits up into silver bromide and metallic silver, there is therefore formed silver ferrocyanide. The last-named salt undergoes with the potassium bromide a further secondary decomposition, producing silver bromide:—

$$\overset{\text{Silver Ferrocyanide.}}{Ag_4FeCy_6} + \overset{\text{Potassium Bromide.}}{4KBr} = \overset{\text{Silver Bromide.}}{4AgBr} + \overset{\text{Potassium Ferrocyanide.}}{K_4FeCy_6}$$

We have, therefore, as the result of the reaction, only pure silver bromide, and without any foreign substance in the plate, instead of silver sub-bromide and metallic silver.

2. I have already stated that a highly sensitive gelatino-bromide plate loses the greater part of its sensitiveness by being treated with a mixture of potassium ferricyanide and potassium bromide; precisely the same thing happens when it is treated with potassium bichromate. This loss of sensitiveness has, up to the present, been attributed to insufficient washing; but, as I shall show, this view is a mistaken one. Gelatino-bromide plates of various kinds were soaked in a two-per-cent. solution of potassium bichromate, and then washed for six hours in running water. At the end of this time the gelatine was carefully analysed,* but no trace of chromium could be detected; to make perfectly sure, however, the plates were again washed in running water thirty hours more. A comparative examination of the plates by means of the photometer showed that their sensitiveness had been greatly lowered; for instance, an emulsion which had been cooked for half-an-hour was found after treatment with potassium bichromate to be not more sensitive than one which had

---

* A few grains of the emulsion were dried and incinerated, and the ash was then fused with sodium carbonate and potassium nitrate; the fused mass was then lixiviated with water, and the liquid which flowed off was tested for chromic acid.

not been cooked at all, and a gelatino-bromide which had been boiled for one-and-a-half hours until it had become completely fogged was equally wanting in sensitiveness. These results were established by Captain Pizzighelli and myself after a careful investigation, a detailed account of which will be found in the *Photographische Correspondenz.**

Kenyon's method of boiling an emulsion for a long time, and then correcting the fog by means of potassium bichromate, I hold to be quite ineffective for the preparation of highly sensitive plates. Emulsions made by Captain Pizzighelli and myself according to this method were found to be non-sensitive in a very high degree. An emulsion which had been boiled for one-and-a-half hours, and then treated with potassium bichromate, as Dr. Kenyon directs, was much less sensitive than an ordinary emulsion after boiling for half-an-hour.

◆

By-the-Bye.

"ARTICLES DE PARIS."

We do not alone represent Great Britain at this moment in the gay capital. Paris in eight hours and a half is just as convenient a spot to spend one's Easter holidays in, as many pleasure resorts on our own side of the Channel, and Englishmen are not slow to avail themselves of the circumstance. "Nice—very nice!" we hear repeated again and again in the Rue St. Honoré; the colonnade of the Rue de Rivoli, by the Louvre Hotel, is redolent with Cockneyism; and when we breakfasted at the Hotel Continentale on Sunday, to get a sight of the magnificent dining hall in this the newest and grandest of Paris caravanseri, the first thing we heard from one of the adjacent tables was, "I'll take some roast beef, please."

All this has nothing to do with "Articles de Paris," but reminds one more of town-made manufactures. True; but as we are to put down our Paris impressions, this one we record first, as the most marked. After all, we protest, the way to see Paris is not so much to "do" it in the ordinary sense—searching through museums, churches, picture galleries, &c., &c.—but rather to do nothing at all but loiter along the streets (the old-fashioned ones especially), where the thoroughfares are narrow and the houses so closely crowded together that they seem flattened and the elongated by their intimate neighbours; where the pavement is scant, or there is none at all; where wine-shops and white-windowed restaurants have grown firmly together; where a fine bonnet-shop is found cheek-by-jowl with a modest fruiterer's; where there are shy cabarets—they are still to be found in Paris—to remind one that such things as revolutions have been, and tiny tobacco shops, with their red lamps, kept by dames of the old school. The northern Fauxbourgs and the busy markets are still the best parts of Paris, notwithstanding the electricity-lit Avénue de l'Opéra and Place de la Comédie, and we still prefer to the Rue de Rivoli, that interminable little Street la Rue Neuve des Petits Champs, always reminding you of Thackeray's well-known lines:—

A street there is in Paris famous,
For which no rhyme our language yields,
Rue Neuve des Petits Champs its name is,
The New Street of the Little Fields.

To come to photography. One thing is particularly striking. Cartes-de-visite are becoming a rarity. The first studios no longer care to produce them, although, of course, they are still on the list of prices. One firm—Benque et Cie.—whose name is familiar to us at home as a house which of late years has come to the front by reason of its fine cabinets of actresses and distinguished characters, assured us that they had not produced a single carte this year, all their works being confined to cabinets, panels, and the "Paris portrait," a picture the same height as the panel, but half an inch broader. The Maison Lejeune, also one of the best and most select of Paris studios, whose speciality, our readers may remember, is *la carte Russe*, a vignetted portrait on a black ground, rarely takes a portrait of the smallest dimensions; and in Nadar's studio we do not even remember to have seen a carte picture.

Reutlinger, on the Boulevart Montmatre, is showing fresh life. Before the war of 1870-71 he was prominent in the first rank; but his nationality considerably damaged his reputation. But his work is not to be denied, and he is coming out strong in cabinets—oval portraits on a white ground, the whole being very finely glazed. The *carte Russe* he is also producing, and with considerable success; in fact, it has always been a surprise to us why British photographers have never taken to this charming style. Another photographer on the Boulevarts is also making himself prominent, one whose work we do not remember to have seen before—Van Bosch. His establishment is on the Boulevart des Capucines, and he is noted for pictures at once forcible and brilliant. There is plenty of life in his work, which is executed with a boldness and *savoir faire* that bespeak the master. He, as well as his neighbours—Guille et Nicosky, who produce excellent cabinets—are pushing the very large style, which is known, we believe, by the name of "Mammoth portrait."

Dagron—a name prominent during the Paris siege, for his firm it was that prepared the micro-photographic despatches that came into the beleaguered capital by pigeons, constituting "la poste ærienne"—has always been distinguished as a clever portraitist, and executes some very fine cabinet work—the standard portrait, it may be said, in Paris just now. The charge, by the way, for a dozen cartes-album (for so our French neighbours term the cabinet) is, in the first studios, from 60 to 80 francs a dozen.

A new feature among the best Paris photographers is to have an exhibition or a gallery in some frequented thoroughfare, where their pictures can be well seen, for in some cases the studios are situated in less frequented thoroughfares, or in streets where a good shop window cannot readily be had. Thus MM. Benque et Cie., who reside in the *Boissy d'Anglas*, have opened a little show in the *Rue Royale*, which is certainly traversed by every visitor to Paris more than once during his sojourn. Walèry, whose studio is in the *Rue de Londres*, has a similar little exhibition of his work in the *Rue de la Paix*, and the aristocratic Maison Lejeune has a tiny gallery in the same well-known thoroughfare. Pierre Petit, in the Avenue de l'Opéra, exhibits some large painted portraits produced by an entirely original invention, termed Linographie "Brevété 15 ans." The portraits are certainly very well executed, but we both doubt the subtlety and originality of Linographie. As "Sardines à l'huile" were said by the Cockney to be nothing more than "Sprats in ile," so we take it Linographie means nothing more than enlargements on canvas.

At the top of the *Avénue*, one on each side, are the wonderful galleries of Goupil and Braun et Cie. Goupil's *photogravure* results are simply marvellous. "How does he do it?" is all one can say. Photo-engravings, twelve and fifteen inches across, produced from paintings, are here with all the vigour of a steel engraving, and with all the fidelity of the original into the bargain. The "Phototype" results, produced on the Quai Voltaire, of which we have specimens once a week in our own newspaper, "Life," and which results are manifestly produced by collotype, are weak and monotonous compared to the pictures of Goupil; and comparison is easily made, for Goupil copies the same pictures as the workers of the "Phototype" process. Verily has M. Rousselon worked to some purpose in elaborating his method of "photo-gravure."

Here is a happy application of photography. It is a series of pictures met with at every corner, proving absolutely the efficacy of a certain "elixir" for the hair. We have a photograph of a lady showing hair to the length of 178 centimetres, after having employed the elixir but eleven months—not even a year, mark you. You cannot doubt the lady, for there is her head and there is her hair, and, besides, the picture is guaranteed "d'après nature"; neither can you doubt the length of the hair, for it reaches to her heels. The only thing, indeed, in the face of this evidence, you can doubt—if of a doubting nature—is whether it is really the elixir that has brought about such a luxuriant crop.

---

* See Photographic News for 14th April, 1881, p. 176.

"Horses and carriages to let or for sale," announces an agency in Paris, and outside is exhibited a series of large photographs of the different vehicles ready horsed at the disposal of customers. It is an excellent idea, for one gets a very good notion of a "turn out" in a photograph. In some cases you may hire coachman or footman as well, and here is his picture, to take him or leave him.

We purchased for ten francs in the Rue 4 Septembre, one of those camera tripods to which reference has already been made in the News. It is a cane standing nearly four feet high, and contains two metal tubes, one inside the other, which, taken apart, constitute a serviceable and rigid tripod. Moreover, there is a ball-and-socket joint at the top (made rigid at will) whereby the camera may be depressed, elevated, or tilted without difficulty. A stud permits of the attachment of a weight to further steady the tripod. It is one of the neatest and most efficient stands for the tourist we know of, and any travelling-photographer on his way to Switzerland or the Tyrol, via Paris, should call in at 35, Rue 4 Septembre, and look at the little invention.

The "At Home" next week will be "M. Adam-Salomon at the Rue de la Faisanderie, Paris;" the next "By-the-Bye" will be "The Publication of Photographs."

Notes.

The administration of French light-houses proposes to illumine the coast with electricity at three of the most important stations, in order to give this method of lighting a more extended trial. In this country, the electric light has been used in the Dungeness lighthouse since 1858, and may be seen on a clear night shining across the black waters for a distance of thirty miles; its brilliancy at this interval is equal to that of a star of the first magnitude.

A saturated solution of hyposulphite of soda applied with a cloth or brush is mentioned by Dr. Davenport, of the Massachusetts College of Pharmacy, as one of the best means to remove all tarnish from the surface of silver. A solution of cyanide of potassium, as most people know, is also useful for the same purpose, but, unfortunately, the silver always seems to tarnish more rapidly after its application. In any case, hyposulphite, being comparatively harmless, should be a more popular compound to use.

George Cruikshank's "Omnibus" of 1842—only two years, therefore, after photography was published to the world—contains some humorous lines upon the new art, which read quaintly enough at this distance of time. Sun, the great photographer, we are told, may well create surprise.

"........... For, while the moon,
Who only draws the tides, is clean outdone,
The stars are all astonishment to see
Earth, sitting for her portrait to the sun!"

The following seems to be a modification of the Pellet process. Copies of drawings or designs in black-and-white may be produced upon paper and linen by giving the surface of the latter two coatings of—

Gum-arabic	... ...	7 to 10 grammes
Citric acid	... ...	2 to 3 ,,
Iron chloride	... ...	4 to 6 ,,
Water	... ...	85 cub. centimetres.

The prepared material is printed under the drawing, and then immersed in a bath of yellow prussiate of potash, or of nitrate of silver, the picture thus developed being afterwards put in water slightly acidified with sulphuric or hydrochloric acid.

The Minister of Education in Austro-Hungary has sanctioned the employment of photography to aid in the development of archæological science. All ancient examples of architecture that may be considered sufficiently important are to be photographed, with a view to securing records of value, alike for instruction and for the National Museum.

An interesting physical fact has just been proven by photography. It has long been known that if you look at an object through a horizontal aperture, it appears more luminous than if you look at it through a vertical aperture. That is to say, that if you are in a darkened room, and look through a chink at a picture or a statue or a lighted lamp, these objects appear lighter to the eye if the chink happens to be horizontal, than if it is vertical. By many, this circumstance has been held to be simply an illusion, but photography has now shown it to be perfectly correct. M. Trève has tried the experiment with a gelatine plate, and reported the result to the Academy of Sciences in Paris.

To prove the phenomenon was, indeed, very simple. M. Trève made use of two chinks in a screen—the one upright, the other horizontal—forming a cross. Behind the screen was a lamp, so that a luminous cross shone upon his sensitive plate. An exposure was made, and on development it was found that while the light had acted only feebly in a vertical direction, its horizontal marking was very pronounced. M. Trève tried the experiment with solar light, electric light, and diffused light, but in every case it was found that the horizontal chink emitted more light than the vertical one.

"Special Correspondents" of the camera are no longer possibilities, but realities. Mr. J. Thomson represented the *Illustrated London News* at the Brighton Review on Monday, and, provided with the necessary authority, was enabled to secure a series of instantaneous views of an interesting character, one or two of which will appear in the paper. The facilities given to the "special" photographer were so satisfactory that not only was he at liberty to take pictures from chosen points of vantage, but was enabled to reach town again by 6 p.m. to develop his plates.

The Cornwall Polytechnic Society are making arrangements for the usual exhibition of photographs at their annual gathering. Mr. W. Brooks, of Reigate, has again been requested to act as juror, and to take charge of the photographic collection.

Gem portraits at sevenpence-halfpenny a dozen in the Whitechapel Road may not seem aristocratic, but it is different in the Palais Royal, where these "bijou" pictures are sold in the same row as diamond bracelets that cost thousands of pounds a piece. It sounds very well in French, "Portraits 1 franc 25 cents. la douzaine, livrés de suite, garantis ressemblants et inaltérables."

The public often wonder how it is that portraits of actresses and other attractive personages usually succeed so much better than their own. They sit to the same photographers, and yet it is seldom that their pictures are so perfect in pose, or so finished in execution, as the cabinet or promenade portrait of Madame Patti or Mlle. Chaumont. Here is one reason, at any rate. When Madame Judic sat the other day to MM. Benque et Cie., at Paris, the firm secured no less than 132 different clichés of the famous comedy queen, being six negatives of twenty-two different poses. No wonder, then, that we see a happy likeness occasionally of a popular favourite.

The mounting of a slab of glass—or rather glass-plate—over a portrait is nowadays frequently adopted for enhancing the qualities of small photographs. A pleasing change is to cut the portrait oval, and to put a looking-glass instead of plate glass over it, there being, of course, no silver where the photograph is. The result is an elegant little mirror with a photograph in the centre.

We noticed in a picture gallery, the other day, that several artists engaged in the copying of master-pieces had provided themselves with hand-photographs of the work before which their easels were placed. Especially when the copy is not painted the same size as the original, the photograph is said to aid much in preserving the proper proportions.

The principal points of M. Janssen's last memoir to the Academy on measuring light by means of photography, and comparing in this way the comparative radiating power of sun and stars, is thus summarized :—"A shutter with triangular aperture is made to pass with uniform motion of known rate before a sensitized plate; this gives (with light) a series of shades on the plate, decreasing from the base side to the apex side. To compare the sensibility of two plates, differently prepared, or the photogenic intensity of two sources (using two like plates) the points of equal shade on the plates are noted. (The photographic intensity does not increase as rapidly as the luminous intensity.) For the sun he finds the time of action (with gelatine bromide of silver plates) must be reduced to $\frac{1}{10000}$ sec. to give the most rapid variation in the opacity.

Topics of the Day.

MODERN CYANOTYPE PRINTING.

BY DR. J. M. EDER.

Although Herschel showed in 1842, by means of ferro-citrate and ferro-cyanide of potassium, how positive cyanotypes were to be produced (blue lines upon a white ground), the process was one that has rarely been adopted in practice. It is so exceedingly difficult to obtain clear prints; the ground is always more or less blue.

Pellet was the first to show results of a faultless character, and in the last International Exhibition held at Paris in 1878, some very fine positive cyanotypes were to be seen. The process, however, by which these were produced was not made known in its entirety. It was simply stated that the employment of slimy, gum-like substances was resorted to.

The details of a most excellent gum-iron process have now been given by Captain Pizzighelli; this method works thoroughly well, and yields most satisfactory prints. Thirty volumes of a solution of gum-arabic (water five parts, gum one part) are mixed with eight volumes of an aqueous solution of citrate of iron and ammonia (water two parts, double salt one part), and to the mixture is added five volumes of an aqueous solution of perchloride of iron (water two parts, iron one part).

The mixture appears limpid at first, but soon grows thicker, and it should be used quickly after mixing; it is applied to well-sized paper by means of a brush, the paper being dried in the dark.

Any design, drawing, or tracing may be employed as negative, and, after printing a few minutes, the development is proceeded with. A solution of ferro-cyanide of potassium (water, 5 parts; ferro-cyanide, 1 part) is applied with a brush, and the picture appears almost instantly as a dark-blue positive. As soon as every detail has appeared, the print is quickly rinsed, and then put into a dish containing dilute hydrochloric acid (water, 10; acid, 1), when the image becomes clearer and brighter, the ground gets white, and the gum-iron film is removed. After further washing the print is dried.

The printing and finishing of impressions proceed very rapidly; in fair weather, it takes from one to two hours to carry out the whole process, preparing the paper into the bargain.

The whole secret of success lies in the use of the gum-arabic, which forms with the iron salts an almost insoluble combination, covering the paper like a varnish. For this reason the pores of the paper are not filled with colouring matter where no colour is wanted. The acid bath removes the varnish-like film of gum, and leaves the clear positive picture in blue behind.

The "Topic" next week will be "On Soluble Bromide in Gelatine Emulsion," by Captain W. de W. Abney, R.E., F.R.S.

◆

FRENCH CORRESPONDENCE.

New Shutter with Double Flap by M. Guerry—Enlargements on Gelatino-Bromide Paper—Two New Emulsions—Separating Metallic Salts from Gelatine Residues—Celluloid Plates—Postponement of the Award of the Gaillard Prize—Photographs of the "Golden Fly."

New Shutter with Double Flap by M. Guerry.—At the last meeting of the Photographic Society of France very little of sufficient interest to be recorded was brought forward. We were shown a new shutter with two flaps by M. G[illegible]y, put in motion by pneumatic pressure. The two flaps can work together, or each may be made to have a different velocity, and the one which allows the rays reflected by the ground to pass can have its rapidity lessened to any required degree; this enables the light from the sky, which requires a shorter exposure, to be shut off sooner, and, if it be desired, only one of the flaps can be worked at the same time, namely, that which moves from below to above. By this instantaneous shutter the duration of the exposure cannot be measured; still it is a very ingenious instrument, and very well adapted to the wants of the present rapid photography.

Enlargements of the Gelatino-Bromide Paper.—Some enlargements on gelatino-bromide paper were exhibited on behalf of M. Morgan; they are very fine, and have a blackish-grey tint, which, though not well adapted for small prints, has a charming effect in enlarged photographs. These enlargements were taken in twelve seconds by means of artificial light. The process by which they are taken is most convenient, and simplifies to a great degree the old method of enlargement. The impressions are taken directly by means of a simple magic lantern, which projects the negative on a screen covered with gelatino-bromide paper; they are then developed with ferrous oxalate. There is only one criticism which I could venture to make on this process, and at the same time I should like to suggest a correction, which might render it complete: the prints taken in this way scarcely seem to be very durable. The reduced silver confined within the gelatine, even though the latter be tanned with alum, is in contact with the paper, and is, therefore, likely to be deteriorated by damp. I think that in order to ensure the durability of an image formed in gelatine by the reduction of silver, the medium should be isolated from all direct contact with the air or with moisture. By plunging the print into a solution of paraffin in petroleum spirit, the pores of the gelatine will be stopped with a delicate substance containing no oxygen, but possessing great transparency, which would give the prints a very pleasing effect. In this way we should be certain to have images completely protected from all action of the air, or of the vapours which it contains. It has been shown that the hydro-carbon above mentioned is completely successful in protecting the phosphorescent sulphides, and I see no reason why it should not be used with equal success in preserving prints taken in unstable substances from all injurious effects. In giving this advice, I am moved by the desire to see the extra rapid processes employed in positive printing. We shall go back, rather than advance, if we do not succeed in finding a remedy for the instability which seems to be inherent in prints of this kind.

Two New Emulsions.—Two new emulsions have lately been presented to our notice. The first of these is the invention of M. Jonniaux, of Liege, and is very similar to the one invented by Dr. Vogel. It is sold ready made in bottles, and when used, the bottle is placed in a water-bath over a gentle heat; when the emulsion has become fluid, it can be flowed like collodion over the plates, which must be previously warmed; and when the plate is properly coated, it is placed in the drying-box in a perfectly horizontal position. This emulsion differs from that of Dr. Vogel, in that it does not contain so much pyroxylin, and that alcohol has been substituted for water; only a few drops of acetic acid are added. M. Audra has tried this new sensitive product, and pronounces it to be very good. The other emulsion is one invented by M. Stoerk; this one is sold in bottles at all the photographic shops, and is in a liquid state. Its base is methylic alcohol; it keeps very well, and is not dear, as a hundred-gramme bottle only costs three francs. This cheapness is a great advantage, but in order to be of service, the product itself must be good, and on this point I can pronounce no opinion, as I have not tried it. We certainly seem just at present to be inundated with an avalanche of these sensitive substances, and the question is how the numerous manufacturers find a sale for them; but there can be no doubt they have a great influence in popularizing photography, as they tend to increase the number of those who practise our art and its various applications.

Separating the Metallic Salts from Gelatine Residues.—At the same meeting of the Photographie Society, M. Davanne recommended albumen for treating the residues of gelatino-bromide; the albumen separates completely the metallic body from the organic product.

Celluloid Plates.—M. David gave an account of some experiments he had been making in order to obtain thin sheets of celluloid fit for photographic work. Like M. Fortier, he believes that this substance is sufficiently transparent and flexible to form a good material for photographic plates, provided it can be cut sufficiently thin. His various attempts to cut it have not been successful, but with hydraulic pressure of 150 atmospheres he has produced sheets of from a half to one millimetre in thickness. The celluloid requires to be pressed between two sheets of some substance like wood or smooth cardboard; without this the result is not so complete. M. David has succeeded in producing pellicles of this kind, coloured blue, which, in consequence of their tint, soften the hard action of light that passes through white glass. There is no doubt that with further experience these gentlemen will be able to produce flexible and transparent supports which can be readily prepared. I think, however, that they will have to render them less inflammable, for if only a spark falls on one of these leaves it is sufficient to produce rapid combustion. The best way that this can be done, I think, will be by discovering some transparent coating capable of protecting the celluloid from fire.

Postponement of the Award of the Gaillard Prize.—As I am on the subject of flexible supports for photography, I ought to mention that the international competition for the Gaillard prize has been postponed to the 31st of December, 1881, none of the competitors having succeeded, in the opinion of the judges, in finding a process worthy of this prize. The great difficulty, to my mind, lies in knowing what it is that the judges actually require; they appear to have laid down a very distinct programme, but in reality its terms are too vague to enable one to know what it is that one has to look for—why it should be this rather than that. However, the postponement of the award will, perhaps, give the competitors a greater opportunity, and between this and the end of next December something may be discovered.

Photographs of the "Golden Fly."—I have before me some very successful photographs of the "Golden Fly." The fly is a female acrobat, who seems to fly in the air like the insect whose name she bears. The illusion is complete, for neither in the theatre, nor on the photograph, can be perceived the thin steel wire by which she is suspended. Without the instantaneous processes of the present day it would be quite impossible to produce an object thus suspended in the air, and taking the most natural positions, but in a continual state of movement. These photographs are certainly a feather in the cap of their author, M. Bernoud, photographer, of Lyons. LEON VIDAL.

◆

SOUTHWARD HO! OR, EASTER MONDAY.

BY A "SPECIAL CORRESPONDENT."

THE train in which we sped "special" speed southwards was crammed with a corps of Rifle Volunteers, eager for the fray on the breezy downs of Brighton. They were a merry crew, strong-lunged and large-limbed, many of them, and altogether men of improved physique, resembling much more closely members of the regular service than they did some half a score of years ago.

The men were thoroughly in earnest about the work before them, but the most punctilious attention to discipline did not prevent their giving free vent to hilarity in song and chorus, mingled with the rattle of the drum and martial tones of the bugle and fife. It was a lightsome morning, and as the train swept through the green glades of Surrey, glimpses were afforded of budding hedgerows, banks of primroses, and woodland nooks bedecked with hyacinths.

The villagers were holiday-making, and could be discried laying wait about the sunny gables of cottages to welcome the "red coats."

We felt much at ease, and refreshed by the loveliness around. But the memory of the fog and grime of London, and fitful spasms of uneasiness about the condition of our plates, marred our perfect repose. A new spring shutter would obtrude itself, and totally eclipse the most sylvan scene. It assumed a distinct personality, asserting that, were it screwed up correctly, it would stake its existence on perpetuating the loveliest scenes in the most bewildering fractions of a second. It was an ingenious device of mingled brass and mechanical skill, entirely devoid of artistic merit.

Intervals of perfect calm interposed, when photography with its slimy and deceitful gelatine were blotted from our "ken."

Brighton at last, with a Nor'-East wind blowing across the Downs, causing an apparent absence of atmosphere.

"The city by the sea" recalled a map; far and near objects presented themselves with microscopic distinctness. The light was perfect—white and pure. But what is that—a cloud in the distance, no bigger than a man's hand? It spreads, and casts a shadow over the Downs. "It is dust from the Downs," said a passenger in "war paint." It was even so—a sort of Brighton simoom was blowing. It proved the most formidable foe the Force had to face on the field, and no friend to photography.

Brighton was early astir with trumpetings, and pipings, and troops gathering on the parade grounds. Soon the companies formed, and marched for the field; some one way, and some another. As for ourselves, we took a middle course, and ascended from the Steyne the steep slope of the hill. Struggling along with a cityful of old and young women, mingled a few men and boys. We at last came to the "course." There the wind was at work whisking up the dust from miles of undulating dry common, and blinding the spectators.

From the Grand Stand we exposed a plate in the teeth of the wind. The field included a mass of Volunteers marching into position—a country fair in full operation in the foreground, with thousands of people in motion. It was a severe test for the spring shutter, but it proved equal to the task. Armed with a Press ticket and one from the Local Chief of Police, we found it possible to go where we listed within the lines. Crossing the Downs to the field of action some two miles off proved most difficult, for the wind and dust almost stopped our progress.

As we passed tents and vans, showmen, vendors of beer, and minstrels, were driving a noisy trade. Thousands of thirsty souls were there, and they drank, keeping up a steady fire of soda and ginger beer corks, until their enemy was quenched. Our camera-bearer, a native, lingered by the way; he, too, was thirsty, and confined his practice solely to the wet process.

At last the sham fight. The gorse has caught fire in front of the attacking force, and the smoke effectually covers their movements. They are really close on the enemy before they are observed. A cheery fire is kept up, while we have a shot or two with our breach-loading camera.

Then we follow the fortunes of the fight, shifting about, planting down the tripod as if we meant to "shell out," and cover the retreat of a division.

Noticing a small detachment of Artillery plunging through a ploughed field, we stole down upon them, selected our position, and would have taken them to a man; but they pulled up, bang went the guns, and the scene vanished in a cloud. When the smoke cleared off a rush was being made for our position; the camera was caught up, and we effected an honourable retreat. Again they halt, and setting the camera on a knoll, we have a shot, and secure six men, and two horses and-a-half. When the affair is over, our bearer is in a woful plight; he appears to have been picked out of a dust-heap; he has two circular earth-works round his eyes moist and black, and similar defences gird his mouth and nostrils. We ourselves are not a whit better off; half blind and begrimed we close our photo-campaign at the Grand Stand, hasten to town to develop, leave by the 4·45 express, and arrive in London at 6·15, satisfied with our day's work.

A NEW CLEARING SOLUTION FOR GELATINE PLATES.

BY JOHN COWELL.

It is now an acknowledged fact that gelatine must be brought into general use by photographers. No doubt collodion is too old a friend to be forgotten or put on one side; but, with all its advantages, it must give way in many things to its rival—gelatine.

There is little doubt but that the latter is more difficult to work, or, rather, will not allow of any carelessness on the part of the operator. It would be of no benefit to my readers to enumerate the difficulties I experienced with gelatine plates five or six years ago; sufficient to say that about eighteen months since I once more launched into gelatine-plate work. On receipt of my first batch of plates I set to work, and was delighted with most of the results. The negatives seemed nice and soft when looked through against a dead wall. I very seldom look at a negative held direct against the sky, as its quality can always be better judged in the aforesaid way, whether it be a wet or dry plate, providing always it is not one of the old style—thick as a board. But this is going from the subject. These first negatives were very nice, but they did not print to please me. Shortly after, I had occasion to go to London, and saw one of the first dry-plate makers demonstrate; from him I learnt that it was better in development to use the ammonia and bromide first, and then add the pyrogallic. My first negatives I took with me, showing them to some of the best authorities on dry plates, and they were considered good negatives. I spoke about the yellowness of the film, and this was considered an advantage, as it made them print more brilliant, being so non-actinic; but of this I was not quite convinced, as it is not the colour so much as the fineness of the deposit that makes negatives print so much better than they look.

I now set to work to destroy this yellow stain, which was attributed to oxidation through not having sufficient solution in the dish when developing. I tried to the best of my knowledge everything that was published to produce clear *shadows*, but was dissatisfied with each and all. Muriatic acid, which was one of the first means published, I was disgusted with, as I had a formula of my own that worked better, although not quite satisfactorily; yet, after considerable experimenting, I was successful, and guarantee that all who are careful enough to make a note of the few very simple hints below, will be in possession of a power to produce better printing negatives.

Citric acid is really the basis that produces the desired effect, and for its simplicity it might be found useful to some to adhere to my first formula:—

Citric acid...	1 ounce
Water	5 ounces

A solution of this strength acts very quickly, and produces the effect desired in about thirty seconds. I would warn my readers against leaving the negative in citric acid alone for any length of time, as the acid is almost sure to make the film leave the glass. There is one point of usefulness attached to this form that I may suggest; where it is really necessary to make a reversed negative, it can be accomplished in this manner. Leave the plate in citric acid for about fifteen minutes, then take it out, and, before washing, squeegee on to the negative a piece of any transparent medium (to form a support for the film) slightly coated with gelatine.

After standing a little while, it will strip off the glass. The citric acid toughens the film, and at the same time frees it from the glass; any person who can do a collodion transfer can by this method transfer a gelatine negative.

Another advantage that will be found of value with the strong formulæ is the power of locally reducing density or giving more transparency to any desired part, thereby greatly improving the finished result. If a negative is about right with the exception of any part, such as hands, face, &c., that is too dense to give detail, all that is necessary is to allow the negative to dry, or partially so, and then with a brush paint on either of these solutions where desired. This will wonderfully improve the printing qualities The negative should, after this treatment, be well washed.

My second formula is—

Citric acid	2 ounces
Alum	1 ounce
Water	10 ounces

This can be kept as a stock solution, and diluted about two-thirds to form a bath for immersing the negatives. I may mention that Mr. B. J. Edwards' modification will be found a very convenient formula,* but I have become so used to keeping a stock solution of citric acid and of alum, mixing and diluting quite by guess, that I never weigh, as it is really not very important what the strength is. A weak solution will be found to answer for general use, keeping the strong stock for special cases.

There is a mistaken idea existing amongst many in reference to this objectionable stain; it is really caused by the oxidation of the pyrogallic acid. As is well known by photographers, pyrogallic has a natural tendency to absorb oxygen, and when made alkaline by the addition of ammonia, its affinity for this is so greatly increased that it decomposes very rapidly, and the precipitate that is so rapidly formed by contact with the air is at once dissolved, gradually increasing the depth of colour of the solution, which stains the gelatine film, and uniformly clogs up the lights as well as the shadows; such a negative produces a tame, flat print, lacking—if I may use the term—tone. There is a perfect want of gradation; instead of having gradation (say) from one to twenty, you only have from one to ten; or, if I may say so, the half notes fail, which produce the harmony of force.

I think I am right when I say that every printer seems to have a horror of dry plates—especially mechanical printers, such as the Woodburytype, &c. They cannot get in the print what can be seen in the negative. With the solution I have mentioned, the negatives are, however, thoroughly developed.

To those who like slow development, I would suggest that they have a plate of glass cut to fit inside of their developing dish to lie about an eighth of an inch from the bottom, and immediately the developer is poured on the negative, this plate of glass is put on top, care being taken to have no air underneath. This will, to a great extent, prevent the solution discolouring so rapidly, and for an under-exposed negative, the result will be much improved. I have tried many different formulæ of my own to produce a similar effect to this. Tartaric acid I have found *next best* to citric; I myself do not like it so well, but I have already made these notes too long to go into details; some may like it, but I certainly recommend citric acid

I have one more formula that I expect many will object to use, but being so good I give it for the benefit of the few that may try it, as it ought certainly to be made a note of in all dark rooms where gelatine plates are used. It is—

Citric acid	1 ounce
Cyanide of potassium	1 to 2 drachms
Water	10 ounces

After treatment with this formula, the negative *must* be put in a solution of alum *before washing*. This solution can also be used locally.

AN IMPROVED METHOD OF WASHING GELATINE EMULSION.

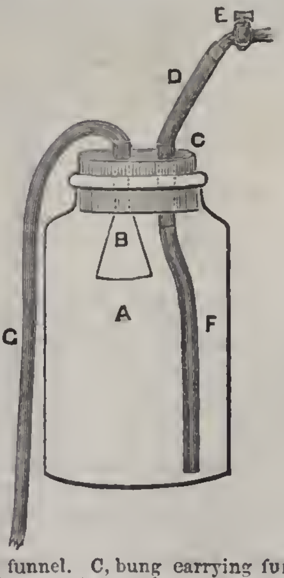
BY J. M. TURNBULL.*

The piece of apparatus to which I would direct your attention this evening was designed with a view to meet my own requirements in the ordinary course of business, and having used it constantly during the last twelve months, I believe I can speak of it with perfect confidence as a simple contrivance which will be found exceedingly useful; my only object in bringing it before the Society is that others may have the opportunity of sharing its benefits.

It will not be necessary that I should here and now describe the various ways of washing emulsion; suffice it to say, that for efficiency, combined with economy, the method recommended by Messrs. Wratten and Wainwright, viz., that of squeezing the emulsion through coarse canvas, is, where quantity is required, undoubtedly the best. This is an excellent method of subdividing the gelatine for washing, but it provides no further way of finishing the washing of the emulsion, and it is here where the method I have adopted of washing begins. The method I formerly used was to squeeze the set emulsion through canvas into a large jar of water; after being stirred up for some time, it was allowed to settle; the water was then poured off, and the jar refilled. On the operation being repeated for four or five times, the emulsion was found to be sufficiently washed. This method, however, was both messy and troublesome, and had the disadvantage of exposing the emulsion to more light than was necessary. Before proceeding further, allow me to describe the apparatus I now use.

It consists mainly of a wide-mouthed stoneware jar, of a suitable size to wash the quantity of emulsion required—a marmalade jar answers well for small quantities. This is carefully fitted with a good sound bung and a glass funnel of a suitable size, so that when inverted, it goes easily in the mouth of the jar. A hole is bored in the centre of the bung, and the funnel tightly fitted, and fixed in with marine glue or sealing wax. A second hole is bored near the edge of the bung and a piece of glass tube inserted of sufficient length to leave about an inch projecting on either side; a piece of india-rubber gas tubing is next slipped on the under side—this must be long enough to reach to the bottom of the jar—another piece, of about a foot long, is put on the *outer* side of the bung; the mouth of the funnel covered with a piece of coarse muslin, secured with string, and a piece of rubber tubing fastened to the small end of the funnel to carry off the waste water; the apparatus is then complete. The whole should, of course, be perfectly light-tight.

I may here describe my own method of working, which will also explain the use of the apparatus. I prepare the emulsion in the early part of the day; when finished, it is poured into ordinary kitchen bowls, and allowed—from fifteen to eighteen hours being sufficient to accomplish this—to set. When perfectly set, it can be taken out of the vessels, in a clean and nice state, without a particle sticking to the dish. The emulsion is squeezed through canvas into a jar of water, the water and gelatine poured into the washing jar, and the bung put in tightly; the whole is then carried from the dark room to the water supply; the end of the rubber tube is slipped on to the water tap, and the water turned on with sufficient force to pass through the contents of the jar. The emulsion is thus kept in constant motion and thoroughly washed. The waste water passes through the muslin over the mouth of the funnel, and is discharged through the tubing into the sink. The annexed drawing will assist the reader to understand the foregoing explanations.



A, jar. B, inverted funnel. C, bung carrying funnel and short piece of tube. D, rubber tube to water supply. E, water tap. F, rubber tube to bottom of jar. G, rubber tube for waste water.

After the water has run for about half-an-hour, the emulsion will be found sufficiently washed. When this is completed, the jar is again removed to the dark room, the contents emptied into a sieve covered with a thin cotton cloth, and properly drained. The cloth, of course, retains the drained emulsion, which can now be melted to coat the plates. Cloth, spread over a glass funnel placed in a bottle, answers nicely for small quantities, say a few ounces at a time. The apparatus is equally suitable for large quantities; all that is required is to increase the size of the jar, &c. The jar I use is an ordinary stoneware wide-mouthed one, large enough to hold two gallons; with this I can wash with ease from fifty to one hundred ounces of emulsion at a time.

---

* Mr. B. J. Edwards' formula, by the way, should be, that gentleman tells me, alum, 1 ounce; citric acid, 1 ounce; water, 10 ounces.

* Read before the Edinburgh Photographic Society.

The method I have endeavoured to explain and illustrate has at least the merit of cleanliness, gives a minimum of trouble, and is of great service where water is not laid on in the dark room.

PHOTO-MICROGRAPHY.

BY GEORGE E. DAVIS, F.R.M.S.*

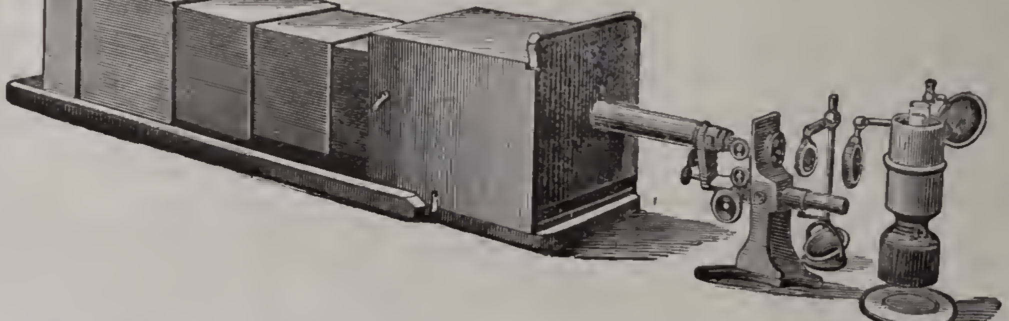
The camera employed is shown in the illustration, and is of the structure and form I specially recommend. You will no doubt hear some quite as strongly advising the use of a bellows camera, but there are serious objections to the use of such a one when extended to four or five feet. This camera, you will observe, is made to detach from the base-board, but for portability only. The base-board should project for some distance in front of the camera, in order to carry the microscope and illuminating apparatus. The whole should be placed upon a firm table, quite free from vibration, in order to ensure perfect sharpness of the image upon the sensitive plate. My original apparatus was of French make and of large size; but it was soon discovered that a large camera was of very little use with the foreign lenses supplied with the apparatus. After this I made one of deal, or rather a portion of one to lengthen an ordinary 7¼ inches by 4½ inches camera, with which I was enabled to take several very good pictures. Finally, I have settled down to the one as shown in the illustration, which was made for me by Mr. Furnivel, of 5, Kay Street, Ardwick Green, Manchester, who treats microscopic cabinet making as a speciality.

And now, perhaps, you can see the usefulness of a practical treatise on the subject; had I been able to see such a camera as this one at the outset, I should be some pounds richer, and instead of plodding along for a whole year, constantly making alterations, I might have spent the time much more profitably.

Perhaps you will be inclined to say that up to this point I have advanced nothing new, many having written on this subject; but what I wish to say most distinctly is, that it was the very existence of this literature which caused me to spend my money with such an unprofitable result.

The dark slide of the camera shown is made to take a large square plate, with carriers for any less size. The most handy dimensions, especially for the beginner, is the quarter-plate, as it is termed, and measures 4¼ by 3¼ inches; it is only for special purposes that it need be larger. Of course the length of the base-board and of the camera body must depend upon the degree of amplification required, and the diameters to which an object is enlarged in my own camera when the sensitive plate is at a distance of 36 inches from the object may serve as a guide in this direction.

This is when using the microscope without the eye-piece, as is the general practice; but it is sometimes necessary to use this, and therefore the list of diameters so yielded is given, and compared with the ordinary amplification at ten inches when used as a microscope merely.



Designation.	Diameters.		
	Without Eye-piece.	With the A Eye-piece.	At 10 ins.
4 inch...	12	36	18
2 „ ...	21	63	32
1 „ ...	37	110	56
½ „ ...	80	240	120
¼ „ ...	173	520	260
⅛ „ ...	360	1000	540
1/16 „ ...	530	1600	800

The microscope employed may be of any ordinary kind, monocular preferably, and if provided with a means of shortening the tube or body, so much the better. The tube should be lined with velvet, to prevent central flare, and the instrument provided with a coarse and fine adjustment, the latter answering the helm when turned either backwards or forwards; but more particularly must it be sensitive to very slight movements of the milled head when *withdrawing* the objective from the object.

Dr. Woodward writes, "The objective selected should always be specially corrected for photography." I cannot agree with Dr. Woodward on this point; no doubt it is very convenient to have one so corrected, but it is by no means imperative. To those as yet uninitiated in the mysteries of the photographic art, it may be necessary to say that the *visual* and *actinic* foci often (though not necessarily) lie in different planes, and therefore an objective which gives perfect definition *to the eye* will often produce a blurred and indistinct image upon the sensitive plate. This may be remedied by withdrawing the objective, by turning the milled head of the fine adjustment; it cannot be told beforehand what allowance is necessary; the only method is by trial and error; some objectives require no correction whatever, while others, which necessitate considerable movement from the object, can be made to yield just as perfect results.

The best way to arrive at the necessary correction is to take a picture at the best *visual* focus, develop, fix, and dry it in the usual manner, and then withdraw the objective from the stage by means of the fine adjustment until the image appears on the ground glass about as indistinct as it does in the negative. Ordinary ground glass is too coarse to focus upon; two surfaces should be rubbed together with a little of the finest emery and water, or a focussing glass may be prepared by coating an ordinary glass plate with spirit varnish, and allowing to dry without heat, or a coating of unboiled rice starch may be applied and allowed to dry on a levelling stand. The correct focus may be obtained by the eye alone; nevertheless, it is always advisable to use a magnifier—an engraver's lens, or an ordinary eye-piece with the eye-lens removed.

It has been stated by several writers on this subject that monochromatic light brings both *chemical* and *visual* foci into the same plane, and therefore no correction is required. I cannot understand how any writer can have fallen into this error, for error it is, and which a single experiment would have set right. Of course the chromatic aberration is disposed of, but we have introduced a new element into our calculations; a lens which is spherically corrected for white light is not so for monochromatic, and therefore the picture is blurred with spherical aberration.

There now remains but to describe the method of illumination; well, there is the lamp, either an ordinary thirty-hole argand gas burner, the rays being manipulated with the bull's-eye condenser, or the ordinary paraffin microscope lamp of no special pattern.

The substage achromatic condenser is only used for powers of greater amplification than the half-inch, or where the camera is drawn out to a great extent. I have used several sources of illumination—sunlight, the electric light, the oxy-hydrogen lime-light, the magnesium light, as well as a paraffin lamp and gas;

---

* Abstract of a paper read before the Birmingham Microscopical Society, Jan. 18th, 1881, and also before the Manchester Microscopical Society, March 3rd, 1881.

but for general work the two last are preferable, seeing that they give nearly all the light required for medium and low powers, and if a very intense illumination is requisite, it can easily be obtained from gas or oil in such an apparatus as the Sciopticon. Dr. Carl Seiler, in a communication to the American Journal of Microscopy, p. 159, 1879, upon this subject, seems to think that wet plates are preferable to dry, and adduces arguments in support of his views. I cannot agree with him, however; dry plates are so convenient, and with good manipulation are capable of producing excellent pictures. There are many kinds of dry plates in the market which are now largely prepared from a gelatine emulsion. Of those I have tried, the preference is given to Swan's, and to those made by Wratten and Wainwright. They are made up in packets of one dozen each, for which is charged three shillings if of quarter-plate size, or measuring 4¼ by 3¼ inches.

Do not over-expose these gelatine plates, for if you do you will get nothing but thin and misty images. From some cause those exposed to gas or lamp-light do not *commence* to develop so quickly as those exposed to sunlight, but if time is given and they are not over-exposed, perfect pictures may easily be obtained. The time of exposure in the camera depends upon the quality of the light, but more, perhaps, upon the nature of the object than anything else; for instance, the section of a kidney of a rat required twenty minutes' exposure, with the argand gas and bull's-eye condenser, while a crystal of glass under the same conditions of light and amplification required only three minutes.

There are two applications of this art I wish to mention, which may be of great utility—I refer to the preparation of wood blocks for the purpose of illustrating microscopical work, and also for the production of lantern transparencies. The greatest expense in producing good illustrations is that of the artist, but if the picture is put upon the wood, the remainder of the work is cheaply and expeditiously performed. One way of doing this is to transfer an autotype carbon picture to the prepared wood block; but to produce good pictures upon wood, it is better to employ the wet collodion process.

A slightly over-developed positive is produced upon glass in the ordinary way, being developed with an iron developer, and the film transferred to the wood-block in the following manner. The block is first to be coated with a gelatine solution made by soaking one ounce of Nelson's gelatine in 19 ounces of water for twelve hours, dissolving with heat, and stirring in a solution of 20 grains of chrome alum in one ounce of water. When thoroughly incorporated, add sufficient lamp-black to form an even black coating upon the wood.

If the block be first coated, it will be dry and ready to receive the film by the time the operator has proceeded thus far. The positive having been taken, developed, and fixed, a piece of gum-paper is "squeegeed" to the wet film, which must then be stripped off the glass; the paper and film may now be trimmed with the scissors, and brought into contact with the prepared block under water, gently squeeged to remove air and water, and set aside for a while so that the two films may become amalgamated. After a short time the block is soaked in tepid water to remove the gummed paper, and it is then ready for the engraver.

◆

Correspondence.

DEFECTS IN PORTRAIT LENSES.

Dear Sir,—Allow me to thank Mr. Burton for supporting my recommendation of a substituted form of lenses for portraiture.

I did base my rough calculations on the back instead of the equivalent focus of the objectives which I mentioned, having the former measurements at hand while I wrote, and also knowing that the discrepancy between theoretical calculation and practical working was sufficiently broad to engulf so slender an error.

I may further add that since I wrote my last "Topic," I have received the Dallmeyer D lens therein mentioned, and I find it quite realize my anticipations; I work it in preference to a forty-guinea Dallmeyer No. 4 B lens, which I have at hand. It is, by practical testing, about three and-a-half times slower than the ordinary portrait objective. Now, if this meant thirty-five in place of ten seconds' exposure, it might then be a matter for serious hesitation; but so long as it simply necessitates an exposure of about seven seconds in place of two, I, at least, must express myself amply satisfied.—Yours very sincerely,

Lyd. Sawyer.

TRADE MARKS IN THE UNITED STATES.

Sir,—It will probably interest many of your readers to learn that a new Act for the Registration of Trade Marks has recently (March 3rd) been passed in the United States. The Act also provides for the re-registration of Trade Marks registered under the law of 1870. British subjects can now register their Trade Marks without the doubt as to the legal value thereof which existed under the old law.—Your obedient servants, Des Vœux and Colton.

◆

Proceedings of Societies.

Photographic Society of Great Britain.

The monthly meeting of this Society was held on Tuesday, April 12th, at 5, Pall Mall, East, J. Glaisher, Esq., F.R.S., President, in the chair.

Mr. J. Anthony Graham and Mr. P. Burges, of Todbury, were elected members.

The **President** announced that it had been decided by the council to hold a series of bi-monthly meetings of an informal character for the interchange of thought and communication. The first of these meetings would take place on May 24.

Mr. **Dilworth Howard** then read a paper entitled "Notes on a Swiss Tour with Dry Plates," and exhibited a series of views.

Mr. **Spiller** inquired whether Mr. Howard had found any interference from the Customs authorities.

Capt. **Abney** pointed out, with regard to some remarks in Mr. Howard's paper in reference to aqueous vapour and atmospheric effect, that a new theory had lately been started attributing atmospheric effect to ozone. He did not know whether photography would throw any light upon this. The production of ozone, Capt. Abney observed, was favoured by a west wind.

Mr. **Payne Jennings** thought, whether atmospheric effect was produced by ozone or by aqueous vapour, the presence of the latter was very valuable to artistic photography.

A Member asked whether Mr. Howard found his plates affected by a sea voyage.

Capt. **Brownrigg** and Mr. **Sebastian Davis**, in reply to the last speaker, gave instances where plates had been sent long voyages and had not deteriorated.

The **President** said the ozone theory was a new one to him. Years ago, when making observations, he had tested for ozone in high places, and had found it, and had tested for it in low places and had not got it, and yet the wind in each instance was blowing from the same quarter.

Mr. **Howard**, in replying, said he had never suffered any inconvenience from the Customs authorities. The best plan was always to declare at once. He could say very little about the action of sea voyages, and as to the ozone theory he thought that photography was scarcely the science which could determine the point. He thought the best times for pictures were immediately before and immediately after rain.

After a vote of thanks to Mr. Howard,

Mr. H. **Berkeley** read a paper entitled, "Suggestions for Bringing Art and Photography in Closer Connection."

At the suggestion of Col. **Wortley** the discussion on Mr. Berkeley's paper was postponed.

Captain **Abney** then read a paper on "The Natural Camera and Lens in Photography." Captain Abney explained that his paper was a resume of an article by Lord Raleigh in the *Philosophical Magazine* for March, in which the writer demonstrated by mathematical formula that it was possible, by reducing an ordinary spectacle lens to an aperture of one-fifth of an inch, to take a picture which should be perfectly sharp—the lens requiring no correction to make the optical and chemical foci agree. Captain Abney added, in confirmation of Lord Raleigh's statement, that on one occasion when in India, having forgotten his lens, he (Captain Abney) had made a pinhole in his camera, and so had taken a photograph by the image thus formed.

Mr. SPILLER said that thirty years ago he had, in conjunction with Mr. Crookes, used a lens of the kind described by Captain Abney; but the exposure was so tedious that it was given up. In his (Mr. Spiller's) opinion, this was a phase of photography which had been tried and found wanting.

Captain ABNEY pointed out that the sensitiveness of photographic plates was a very different thing now from what it was thirty years ago. Photographers frequently used an aperture $\frac{f}{60}$, and as the aperture he alluded to was $\frac{f}{90}$, there was not so great a difference. Of course he did not ask any photographer to throw away his short focus lenses, but what he did say was that if at any time they needed a long focus lens and had not got one handy, they would not be disappointed if they used a spectacle lens in the way he described.

The PRESIDENT, after a vote of thanks had been passed to Capt. Abney, made a few remarks relative to a subject touched upon in Mr. Berkeley's paper—the desirability of the Society having a permanent home. The President said that from the early days of the Society the subject had never been lost sight of, but there were great difficulties in the way, as they would want not only more members, but a great deal more money. He quite concurred, however, in Mr. Berkeley's observations.

The meeting was then adjourned to May 10.

———

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE sixth ordinary meeting was held in 5, St. Andrew Square, on Wednesday, the 6th inst., Mr. JOHN LESSELS (President) in the chair.

The minutes of last meeting having been read and approved, the following gentlemen were unanimously elected ordinary members:—Messrs. Robert Kirkwood, Andrew H. Baird, George Simpson, John Lawson, Gilbert E. Oliver, and Mr. James M'Ghie.

Mr. J. M. TURNBULL next read a paper entitled, "An Improved Method of Washing Gelatine Emulsion" (see page 189), at the conclusion of which Mr. Dobbie introduced Mr. A. L. Henderson, of London (who was on a visit to Edinburgh), to the Society.

Mr. HENDERSON exhibited and explained an apparatus, invented by himself, for washing emulsion.

Dr. THOMSON said the process described by Mr. Turnbull was similar to one used by himself, only on a larger scale.

The PRESIDENT asked if there was any benefit derived from prolonged washing.

Mr. TUNNY said he had never found it to have any effect on the sensitiveness of the plates. Emulsion washed for half an hour, if thoroughly done, worked quite as clean and rapid as that washed for twelve hours.

Mr. HENDERSON said he differed from Mr. Tunny, as Mr. Warnerke had found his emulsion very much improved, both in quality and rapidity, after a prolonged washing in his (Mr. Henderson's) apparatus.

Dr. Hunter, Mr. Brown, Mr. Mathison, Mr. Patrick, and others spoke on the subject, after which Mr. TUNNY laid on the table a sample of French gelatine, very suitable for making emulsion.

The two following questions were next brought before the Society:—(1). "Would photographs mounted on glass be admissible in an exhibition where all other competitors mounted on boards?" (2). "Would they be eligible for a medal at such an exhibition?"

After some discussion the following answer was unanimously agreed to:—If no rules respecting pictures mounted on glass had been previously made, exhibitors were quite entitled to mount in that way, and such pictures were also quite eligible to compete for medals. But it was also the opinion of the Society that a rule should be made in exhibitions to give separate awards for those mounted on glass and those on cardboard.

The PRESIDENT showed an oil painting, by M. Gröb, of Munich, which he proposed to have reproduced, if approved of, by the Lichtdruck process, for this year's presentation print.

Mr. NEILSON proposed and Dr. HUNTER seconded the motion, that the picture brought by Mr. Lessels should be adopted, which was unanimously carried.

Mr. DOBBIE moved a vote of thanks to Mr. Turnbull for his paper, and also to Mr. Henderson for his kindness in bringing various subjects under the notice of the Society.

A vote of thanks to the Chairman terminated the proceedings.

To Correspondents.

⁂ A cheque for two guineas will be given for the best practical essay "How I keep My Books," by a Lady. The following rules must be noted:—The article should be from one to two columns in length; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st May, marked outside, "How I Keep My Books." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected M.S In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final.* The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

C. J. EMERY.—1. We shall be much pleased to receive the description for publication. 2. We have taken everything necessary for wet plates up to 8½ by 6½ on a Coventry tricycle, but it certainly was hard work, and a severe strain on the working part of the machine. Perhaps the form known as the "Devon" might be better for your purpose.

M. J.—The luminous paint, both in oil and water form, is sold by Messrs. Ihlee and Horne, of 31, Aldermanbury.

E. W. F.—You are quite right in your conjecture, but the matter is one requiring some study.

W. W.—It is impossible to say whether the particular form of silver picture you refer to is permanent or not, but, on theoretical grounds, we should feel inclined to regard it as being less liable to fade than an ordinary print on albumenized paper.

JAMES SHERWOOD.—1. You must perform the operation of washing away the soluble parts much more slowly, twelve or fifteen hours being often necessary. 2. About one-third of its volume of methylated spirit.

ARTIST.—No 6, Rosendale Villas, Dulwich, S.W.

IMPOSITION.—There is not under the circumstances any engagement that you should keep and store the negative safely for the customer's benefit; and the glass plate is yours, although the copyright belongs to your client. Would it not be better to come to an amicable settlement?

F. C. M.—1. It appears to us to be the usual thing, but it is impossible to be sure of this. 2. Yes. 3. Somewhat over-printed.

J. BULL.—1. You had better use patent plate. 2. The sample of pyroxyline yields a very horny film, and would be scarcely suitable for making negative collodion. Add more water to the acids.

TYRO.—1. It is soluble in about four parts of cold water. 2. If you make use of the modern rectilinear or symmetrical lenses you will have little or no occasion to use a swing back, as a similar end may generally be attained by raising the front of the camera.

L. T. GROVES.—You will find it much more convenient to print from stone than from zinc, one point of advantage being the fact that the first signs of impending mischief are more readily seen on the whitish stone than on the metal.

MORDANT.—Add one dram of a thirty-grain solution of chrome alum to each ounce.

M. HESTER.—No doubt you are right, but it will probably not be easy to convince your customer of the fact. Would it not be better to do the work over again, and say no more about it?

SILICA.—The ink most suitable is sold in sticks, like a water-colour paint, and it can be obtained from any dealer in printing materials. When required for use it is rubbed up with a little water.

ATMOS.—It is probable that a small gas engine will answer your purpose better than a steam engine. Engines of one-man power are now to be had for about £20.

PHOTO-LITHOGRAPHER.—A much firmer and more solid stand is to be preferred. A long heavy table, with an upright board at one end, and rails for the camera to run on, is a very useful arrangement, as no adjustment is required for ensuring perfect rectangularity of the copy, and, moreover, focusing becomes unnecessary if the top of the table is properly graduated.

22.4.81

LOCAL PATENTS.

This List of Patents is specially compiled for the PHOTOGRAPHIC NEWS, *by* Messrs. DES VŒUX *and* COLTON, *Patent Solicitors and Engineers*, 32, *Southampton Buildings, London, W.C., and Imperial Chambers, Albert Street, Derby, of whom all information, including phamphlets of instructions, may be obtained.*

APPLICATIONS.

ALFRED PUMPHREY, of Birmingham, "Improvements in Supports to be Used in the Place of Glass for Supporting Photographic Films, and in Photographic Cameras for Exposing Photographic Films."

NOTICE TO PROCEED.

JOHN PALMER CLARKE, of 7, Abbey Hill, Bury St. Edmunds, "An Improved Turn-table for Posing of Sitters or Models for Artists' and Photographers' Use."

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1182.—*April* 29, 1881.

CONTENTS.

	PAGE
Some Points of Contact between Electricity and Photography	193
Gelatino-Bromide Paper	193
Photography In and Out of the Studio	194
At Home—M. Adam-Salomon in the Rue de la Faisanderie, Paris	195
Notes of a Swiss Tour with Gelatine Plates. By W. D. Howard	196
Notes	197
Odd Jobs. By the Author of "Looking Back"	199
Topics of the Day—Soluble Bromide in Gelatine Emulsion. By Capt. W. de W. Abney, R.E., F.R.S.	198
Some Remarks on the Natural Camera, and on Uncorrected Lenses in Photography. By Captain Abney, R.E., F.R.S.	200
Correspondence	201
Proceedings of Societies	203
Talk in the Studio	204
To Correspondents	204

SOME POINTS OF CONTACT BETWEEN ELECTRICITY AND PHOTOGRAPHY.

At a recent meeting of the Society of Arts, Professor John Perry read an important paper on "The Future Development of Electrical Appliances;" and in this memoir he puts into clear and unmistakable language many of those ideas which must have flitted vaguely and indefinitely through the mind of every experimenter or student who has followed those developments of electrical science with which civilization has been enriched during the last three or four years. After having placed modern notions regarding electrical measurement in so clear and simple a light that he who does not understand must indeed be dull of comprehension, the professor points out that advancement in the practical applications of electric force depends, to a very large extent, on a just appreciation of electrical magnitudes, both as regards potential and quantity of current; and that any electrical construction not properly adapted to its work as regards these matters is haphazard in its nature, and more calculated to waste force than to utilise it.

Regarding the possibility, or rather probability, of our ever being able to see distant objects—and more especially moving objects—by the agency of electric currents passing through a conducting wire, the words of the professor are rather characterised by that cautious reserve which one expects from the true man of science, than by the rashly vague statements often made by those whose knowledge is but superficial.

Our readers are familiar with the fact that the element selenium, when in a crystalline state, conducts electricity to an appreciable degree, and that its conductivity is notably increased when light shines on it, this increase of conductivity bearing a certain proportion to the intensity of the light. It is easy to construct a selenium cell or surface which shall be well adapted for receiving and registering small variations of light by winding two wires on a strip of mica in such a way that they shall be very near to each other, and yet not touch at any point; and filling up the inter-spaces with selenium. Such an apparatus being placed in circuit with a battery, and a shutter so arranged as to open wider when the passing current increases, may be considered to form the basis of the simplest diaphotic or photo-electric apparatus. When a light of increased brilliancy shines on the selenium cell the shutter opens wider, and more light, say from a lamp placed behind it, reaches the observer's eye.

Here, then, is the the means of reproducing at a distance the fluctuations of illumination to which the selenium cell is exposed; and if it were a question of reproducing a camera image in its entirety, it is obvious that this end might be attained by covering the surface on which the image is received with an enormous number of these cells, each being connected with a correspondingly-placed shutter at the receiving station. The camera image would then be reproduced in all its gradation, and would be something like a piece of mosaic or a Berlin-wool pattern, the fineness of the detail depending on the number of selenium receivers employed. Any telegraphic apparatus involving the use of such an enormous number of wires as would be required in a case of this kind is theoretical rather than practical.

Another step in advance can, however, be made. Let us suppose that only one row of selenium cells exists at the transmitting station, while a corresponding row of shutters are placed at the receiving station, and that the cells and system of shutters are made to move rapidly to and fro, the former in front of the camera image, and the latter in front of a uniformly illuminated surface. If the movement is sufficiently rapid for one lateral movement to be completed within the time that a luminous impression is distinctly retained on the retina, and the movements of both instruments are synchronous, the complete picture will be seen as before, although the number of wires has been reduced to a small fraction of that required in the previous case. Let us now suppose an extreme case, and imagine that one selenium cell could be made to travel over the whole of the illumination field in the short space of time required for continuous vision, and that the shutter could be caused to move synchronously with it, the problem would be solved; we should have vision by electricity by means of a single wire, and also the power of photographing images of far-off objects by telegraph.

The supposed case implies great perfection of mechanism, and rapid responsive action on the part of the shutter; but there is hope that instead of the mechanical shutter, it may be possible to employ thin metallic mirrors so distorted by electro magnets as to throw more or less light on the necessary points. It may be mentioned that when the opening and closing shutters mentioned above are supposed to move synchronously with the selenium cells, they would, in actual practice, be allowed to remain at rest; a moving image of the light spots seen through them being projected on a screen.

GELATINO-BROMIDE PAPER.

Any simplification of photographic operations will be watched with considerable interest both by professionals and amateurs. But perhaps greater attention even than usual will be given to any method of facilitating the process of positive printing. There are few who have not felt on many occasions the great inconvenience of silver printing by the ordinary process. To amateurs especially this inconvenience is so great that a large proportion of them send their negatives to be printed by professional photographers. Printing by development, notwithstanding the beautiful results which can be obtained by many of the processes hitherto recommended, has not, up to the present time, been able to yield results in every respect comparable with a silver print. No time could, therefore be more favourable than the present for ensuring a fair trial of the capabilities of gelatine for positive printing.

It is scarcely necessary to speak of the extreme case of a process whereby a print can be secured from a negative even at night within about ten minutes. Neither need we dwell on the immense advantages of such a system, if only the results are all that could be desired.

But if up to the present time it has not been distinctly proved that the present system of silver printing is destined to be replaced by the gelatino-bromide process at no distant date, it seems certain that as a ready means of procuring enlargements up to any required size, gelatino-bromide paper will be especially effective. So great is the sensitiveness of such paper that no other apparatus is needed for procuring enlargements than an ordinary lantern and an oil lamp. These enlargements seem to be perfect in detail, while their tone is such as to give the impression that they have been finished in black and white. Neither do we think such prints will prove any less permanent than the ordinary silver print. A great impetus will no doubt be given to enlarging by this process, which amateurs even can work without the assistance of cumbersome apparatus, without even the aid of day-light or a dark-room, and, what is perhaps of as much importance, without soiling the fingers or staining the carpet.

But still another advantage has been claimed for the gelatino-bromide paper, viz., its employment for producing negatives as a substitute for glass. Here is a process which promises far greater simplicity, with results as good as any that have been obtained by the sensitive tissues hitherto employed. Paper negatives would no doubt be an immense boon to the tourist, who has had sad experience of the weight of his appartus on a hot day. This would be neither more nor less than a revival of the old calotype process, without its greatest drawback—length of exposure. We doubt, however, whether it will be possible to overcome the obvious objections to paper negatives, especially the coarseness of the prints, owing to the grain of the paper; while probably the disposition of paper to lie unevenly would be a serious inconvenience.

With regard to the method of preparing gelatino-bromide paper, it appears to be tolerably simple after a good emulsion has been secured. It is only necessary to float the paper upon the emulsion, and then to dry it. The development of the image is done either by floating the paper upon the developing solution; or, in the case of enlargements; the ends can be turned up so as to make a tray, in which the developing solution may be poured. No doubt ferrous oxalate will be found more convenient to use than pyrogallic acid for developing the image upon paper, especially on account of the tendency of the latter to stain the paper. It is to be hoped that the ease with which the paper can be prepared will induce many to experiment fully with the process, and it is possible that when pushed to its greatest perfection, gelatine will again be the medium of an important change in photographic operations.

Possibly, it will not be before the gloom of another winter brings prominently into notice the great need of some means of printing by artificial light, that many photographers will be induced to try the merits of gelatino-bromide of silver for positive printing. The busy season is at hand, and there will, it is to be hoped, be no lack of sunshine; but it is probable that, even at this time of year, great advantage would result from the use of the gelatino-bromide paper, to secure quickly a print from a negative. Not only would this gratify the eagerness of impatient amateurs, but it would also prove an incalculable boon in the professional studio, in all cases where a great deal depends upon securing a successful photograph. The public generally do not understand negatives, and are, therefore, frequently allowed to depart without seeing any kind of proof. How easily might a positive proof be secured upon gelatino-bromide paper, and the result criticised while yet there might be time to remedy defects. Time only can prove whether prints produced by this means will prove any less permanent than ordinary methods. The process is, at present, too new for any decisive opinion to be expressed. It must not be forgotten, however, that the image will consist of metallic silver, which may be replaced by other metals, by the usual toning operations.

Probably much more will shortly be known of this process, which has been predicted to make as great a change in the production of the positive as it has already done in the production of the negative photograph.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Carbonate of Sodium Developer—Hyposulphite in the Developer—The Tasimeter as an Actinometer—Bichromate of Potassium for Curing Fogs—Berlin Photographers.

The Carbonate of Sodium Developer.—Dr. Vogel writes us:—"One of my correspondents asked me for a developer which has no smell, and which does not decompose or deteriorate by reason of the volatility of either of its components, like the ammonia developer, or by oxidation, like the ferrous oxalate developer. This induced me to try carbonate of soda, first employed by Eder for collodion emulsions. Eder says that the action of this developer is more feeble than that of ferrous oxalate or pyrogallic and ammonia. But I observed that, in some cases, this developer is superior to the latter. I dissolved 50 grammes crystallized monocarbonate of sodium in 100 grammes water (this is about a saturated solution at 15° C.); from this solution I took 16 to 18 cubic centimetres, mixed it with 36 to 40 c.c. water, 0·6 c.c. bromide of potassium solution (1 part bromide to 4 parts water), and 5 c.c. alcoholic pyrogallic solution 1 and 10. The action of this developer on gelatine plates is a little slower than that of the ordinary pyrogallic ammonia developer, but it gives the same details, and its action can be accelerated by augmenting the quantity of carbonate. The colour of the resulting negative is a little near greenish yellow, and the only drawback is that plates which tend to frill will prove more unmanageable under the action of the new developer, frilling beginning in such cases when water is poured on the developed plates. It can be avoided if the developed plate is not washed, but is immersed immediately in the hyposulphite solution; but the application of the following solution is better—

Common salt	30 grammes
Alum	9 ,,
Water	100 cubic c.

The solution is poured on the developed and unwashed plate, and left on for about one minute. After this treatment the plate can be washed with water, fixed, and washed again, without danger of frilling. I must remark that the action of this developer is very different on plates of different composition; as in the case of my collodio-gelatine emulsion plates, this developer works quicker and denser than any other. The chief advantage of this developer is that the components (alcoholic solution of pyrogallic and solution of carbonate of soda) possess excellent keeping qualities.

Hyposulphite in the Developer.—Eder, who recommends the addition of hyposulphite to the ferrous oxalate developer, in accordance with the proposition of Captains Abney and Wilde, mentions that the chief advantage of this addition is to modify the character of the plates. It is well known that a great many of the gelatine plates in the market give very dense negatives, sometimes too dense, especially with the ferrous oxalate developer. This can be easily changed by the addition of hyposulphite. Ten drops of a solution containing 2½ grains per ounce, to 2 fluid ounces of ferrous oxalate developer, accelerates development and makes the pictures softer, while 20 drops will show this phenomenon in a more remarkable manner.

The Tasimeter as an Actinometer.—Hoorweg has observed that Edison's tasimeter is not only sensible to the less refrangible rays—as red, yellow, &c.,—but also to the blue rays. Moreover, the action of the latter is more intense than that of the former. It is well known that the tasimeter consists of a piece of ebonite which is expanded by the action of rays, and presses against a system of carbon pieces; by the pressure, the power of conducting electricity is augmented, and this can be measured by the deviation of a galvanometer. Hoorweg exposed the tasimeter to the red and blue rays of the spectrum, and observed that under the influence of the blue rays the galvanometer deviated more than under the influence of the red. The contrivance would be simple enough to be employed in photographic studios, and it might allow one to observe the chemical intensity of daylight very easily.

Bichromate of Potassium for Curing Fogs.—Abney first recommended the treatment of a foggy gelatine emulsion with a diluted bichromate solution, and says that this diminishes sensitiveness only to a very slight extent. We have made experiments in this direction, and must confess that the results were highly satisfactory, although it did diminish the sensitiveness to a considerable extent. Eder now publishes some experiments in this direction, and, if we understand him rightly, a good clear working emulsion, by the action of bichromate, loses more than half of its sensitiveness, and a foggy emulsion, made by cooking a good emulsion for one hour-and-a-half, works more clearly after the bichromate treatment; but the fog did not disappear wholly. Our opinion is that the treatment with the bichromate gives different results, according to the nature of the fog. If the fog is caused by impure gelatine, the bichromate is certainly very good in its action, and that may be the reason why Mr. Wilson employs it in his emulsion process.

Berlin Photographers.—Berlin has some clever portraitists, and we have acknowledged the excellence of their work more than once; but it seems that the leading men of Germany have strange ideas regarding the value of Berlin or German portrait work in general. The Empress of Germany has only been photographed once in Berlin, while the Emperor of Germany has posed for a picture only twice during the last ten years; not, however, to a German, but to a French photographer—young M. Braun, of Paris, son of the late Braun, of Dornach. Bismarck, the celebrated statesman, has not been photographed by German photographers for fourteen years, the last portrait of his being also the work of M. Braun, of Paris.

At Home.

M. ADAM-SALOMON IN THE RUE DE LA FAISANDERIE, PARIS.

M. Adam-Salomon comes down the gravel walk to unlock the gate for us. His beard is whiter and more flowing than it used to be a dozen years ago, when we first met the *premier* portraitist, but he is as genial, as warm, as winsome as ever. In his button-hole he jauntily wears the red ribbon of the Legion, and his manner has all the old gaiety about it. He calls out a blithe welcome as he rattles the key in the gate, and shakes hands again and again.

In his kindly hospitable fashion he has insisted on our taking déjeûner with him; but come early, he has said, for "à midi je vous chasse." So between ten and eleven, this sunny April morning, we present ourselves at the little villa, so close to the green confines of Paris and the fortifications as to have been unsafe to inhabit during the investment of the capital by the Germans in 1870. The balmy air is redolent with the odour of wall flowers, and it is so warm that the house door stands wide open. As everybody knows, M. Salomon is a sculptor before he is a photographer, and evidence of his handiwork is here in the little garden, and in the handsome gallery we now enter.

A pleasant chat about friends and acquaintances who have visited him in Paris, or M. Salomon has met in London, revives recollections of that famous display of portraits in 1867, when he took the photographic world by storm. The long article by the *Times* special correspondent at the Paris Exhibition, in which a high tribute was paid to M. Salomon's pictures, our host still remembers with unaffected delight, as also the many other recognitions of his work that have come from Great Britain. His skill as a sculptor has been no less complete, and M. Salomon speaks with deep feeling of the homage paid to his work by the English press, particularly in respect to the bust of Mr. Chadwick, C.B., exhibited last year at the Royal Academy. Unfortunately—and our readers will read it with infinite regret—M. Salomon's eye-sight for some time past has been very defective, and has compelled him to put aside almost entirely his photographic work. "Here is my last essay at posing," said our host, showing an unmounted print; "I did it the other day, but I was able to do no more than pose." It is a standing portrait of a violinist at the moment of *attaque.* The chin presses the instrument, the arm is raised, the bow just touches the strings—the musician will instantly commence.

"It is a gelatine plate, of course, with a pose of three seconds," says our host: "I could not have secured that with collodion."

M. Salomon looks forward with pleasure to practising photography regularly again at no distant date. He speaks brightly and hopefully of work which the new rapid films will permit him to undertake. An exposure of twenty seconds he used to consider a short one in taking the brilliant 10 by 8 pictures for which he was so famous—pictures, as our readers know, not less delicate than they were brilliant. A portrait of Mr. Blanchard, which he took in Mr. Blanchard's own studio in London, is here, and M. Salomon shows it us with pardonable pride, for it proves how well he can succeed far away from his own studio and familiar surroundings.

On either side of the spacious gallery—furnished with rich Turkey carpet and handsome Louis XIV. furniture, its walls being deep chocolate—are examples of his skill as a sculptor. A bust of the late Pope Pius IX. is here, to model which, a journey to Rome was necessary. This is Guizot, full of force and vigour; and this Cousin, another noted French minister, a magnificent work in white marble. Earl and Lady Granville are to sit to our host as soon as his eyes are better, he tells us; at present he is engaged in modelling a bust of Thiers, which we are forthwith invited to see in the atelier. We pass into the garden, and thence into a large room where finished and unfinished work is on every hand. M. Salomon throws off a cloth, and before us, in dark plastic clay, are the familiar features of the late liberator of his country; the lips seem to speak, so full are they of life and vitality, and one can almost perceive a smile playing over the face of the benevolent statesman. It is a marvellous work. These grand models seem to point to the reason of our host's success in photography, for his portraits are essentially statuesque. Relief and plasticity is a marked, if not the principal feature in them, and when we are further invited up into the photographic studio, now alas! fallen into disuse, we see unmistakable signs of M. Salomon's great endeavour to give a statuesque character to his work. Repeated accounts have in past years appeared in these columns of M. Adam Salomon's method of working, but, for all that, our readers will forgive any repetition, we are sure.

The studio is on the first floor of a detached building in the garden, so that light from every side is available. "A droite, à droite, je vous prie!" cries M. Salomon, as we mount the wooden steps, for they are a little unsafe in places. The studio is very spacious, and very few curtains are made use of; so roomy is it, indeed, that you might point the camera in any direction. The principal light is top-light, and here is the alcove or semi-circular background which M. Salomon has repeatedly used with such effect. It is some twelve feet across, and, inside, of a chocolate colour. The way to use it is very simple, and it has the advantage of producing almost every effect of lighting. If need be, the model need not move at all. He stands or sits in the centre, and the semi-circular background is revolved, if we may so call it—shifted round a little to one side or the other—as the photographer deems necessary. Thus the lighted side of the model may be contrasted with the shadow side of the background, and *vice versa*. Again, the background may be bodily advanced or receded from the light—the model remaining stationary—when another modification of the illumination is brought about. Many photographers have a bust or statue in the studio as a *corpus vile* whereon to make experiments in lighting, &c. M. Adam-Salomon, although himself a sculptor, with an array of these at his disposal, does not avail himself of such aid; he employs something more to the purpose. "Madame Tussaud's," he says, jokingly, as he pulls aside the curtain from an alcove. We see two life-sized figures dressed in black coats and trousers, and, to all appearance, habitués of the famous Baker Street establishment. These models M. Salomon employs for his essays in lighting, and since he has here the contrast of black drapery and white features, which is the plague of the photographer, he knows pretty well that if he can succeed with these, he can succeed with live models.

M. Salomon is an indefatigable experimentalist; for some time he employed a red-glass camera in his work—that is, a camera with windows of red glass on top and sides—and he has still a good word to say for it. It was quicker in action than the ordinary camera, and in some circumstances, the slight greyness in the prints from negatives taken therein was not disadvantageous. But, of course, with gelatine plates, any accelerating means of this kind are quite unnecessary.

All who have seen M. Salomon's pictures know that these were never issued unmounted. In the same way as no effort was spared to secure in the highest degree results of modelling and harmony, so M. Salomon never neglected the smallest detail in finishing and mounting his pictures, with the view of securing the very best *ensemble*. His portraits were not only mounted upon glass, but rubbed with a wax or paste, the composition of which has already appeared in these columns, and which we repeat at the end of this article. No better "finish" has since been suggested, and Salomon's encaustic paste still finds a ready sale on the Continent and in this country. M. Salomon told us he had himself purchased it at various times, and laughingly alluded to the grave protestations of a shopman to whom, on one occasion, he had expressed doubts as to the efficacy of the compound.

"When in London I purchased, too, some pictures of myself," said M. Salomon, recounting another anecdote. It was "*dans la cité*," and naturally he desired, before making the purchase, to know whether the portrait was *ressemblant*. "Très ressemblant," was the shop-keeper's assurance; "and on the strength of his word," continued M. Salomon, "I purchased half-a-dozen of the pictures. But from that day to this I could never trace the resemblance myself."

Here is the composition of the Salomon paste, and manner of employing it:—

Pure virgin wax	500 parts
Gum elemi	10 ,,
Benzole	200 ,,
Essence of lavender	300 ,,
Oil of spike...	15 ,,

Melt the whole on a water-bath, mixing thoroughly, and strain through muslin. Or the elemi may be dissolved in the solvents, and the melted wax added after filtration. To make it thinner, add a little more lavender essence.

The encaustic paste is put on the print in patches in three or four parts, and then rubbed with a light, quick motion, with a piece of clean flannel. If a thick, rich coating be desired, a very light pressure in rubbing is used. In the case of a retouched print, the rubbing should be very light.

The "By-the-Bye" next week will be "On Publishing"; the following "At Home" will be "MM. Benque et Cie., in the Rue Boissy d'Anglas, Paris."

NOTES OF A SWISS TOUR WITH GELATINE PLATES.

BY W. DILLWORTH HOWARD.*

I have brought for exhibition to-night a few pictures taken on Wratten's gelatine plates during a brief Swiss tour last autumn; they are attempts to produce something more satisfactory in the way of a tourist's amateurs sketches than what Captain Abney justly calls "maps of peaks."

With wet collodion plenty of charming results have been obtained; the question seems still *sub judice* as to gelatine taking its place. To add my mite of assistance in clearing up the question is my present object.

Rather long exposures, a developer of moderate strength (I used ammonio bromide, with two grains of pyrogallic to the ounce), so as to give somewhat thin negatives, answered best in my hands. The time of exposure was calculated from old wet-plate results abroad, the increased sensitiveness of the gelatine being reckoned at *six times* that of wet collodion. No attempt was made to develop while abroad; the exposed plates were repacked in the boxes and brought home. Some bad weather was met with, but no plate was injured by damp. Wrapping the boxes in gutta-percha tissue would, however, be a wise precaution against a prolonged sojourn above the clouds.

I did not find the difficulty I expected from over-density of the image when snow was represented, and incline to the opinion that with proper (*i.e.*, sufficient) exposure this will not prove to amount to anything serious. In Swiss landscape work it is of the last importance to be able to represent clouds (cumuli at least), snow, and pines without having to use mechanical appliances, giving longer exposure to the sky than to the foreground. This can only be effected by following out the old wet-plate method of exposing for the shadows, and leaving the high lights to care for themselves. With such an exposure, the development must be arranged to bring up the picture pretty quickly, so that too much density is not attained by the lights before enough detail appears in the shadows. Working on these lines, it will, I believe, prove that snow peaks and white masses of cumuli will stand much longer exposure, without injury to the picture, than is supposed by many amateurs.

I do not, however, think that it is altogether wise to be without the means of altering the relative exposure of sky and foreground, as effects may be attempted that are otherwise almost impossible. No one should start on an expedition without knowing approximately the right exposure in bright light for every stop of the lenses he intends to use. If every plate is properly recorded, with good plates, past experience will soon render developing *en route* needless on the score of testing exposure.

My few mistakes on this head were all evident enough, and would probably all have happened, even if I had developed a plate every night as a test. Attention to the log would save many a disappointment, especially those which result from the great tendency that exists to over-expose, from want of confidence in the calculated time at the moment of uncapping the lens: the quicker the plate, the greater the risk. A short focus lens is useful, and I have found a lens of the longest focus my camera would allow, at least equally so. You cannot invariably attain a point of view that will give a proper size and dignity to the object of main interest in the landscape; indeed, some arrangement for magnifying the image would put a new power into the hands of those who seek for photographs of far-off peaks.

---

* Read before the Photographic Society of Great Britain.

A very important point is to aim at securing such an effect of atmosphere as will commend itself to a painter's eye. To obtain this, aqueous vapour must, of course, be present in the air. I do not, therefore, court perfect mountaineering weather for the camera. After rain, or during fine intervals in broken weather, are the golden hours for the photographer abroad; always so even with collodion, much more so when rapid processes enable us to attack with success the problem of representing the swift play of fleeting light and shade over the landscape.

Notes.

The *Times* on Monday discussed at some length Professor Lister's hospital treatment. While agreeing that the plan adopted by the surgeon of King's College Hospital—that of dipping the knife in carbolic acid, operating in a spray of the same antiseptic, and saturating the bandages with this liquid—was beneficial in lessening cases of hospital fever or blood poisoning, because carbolic acid destroys those minute orgainisms termed bacteria, our leading journal pointed out that it was not to be assumed, because bacteria are present in disease, that these had anything to do with the particular malady. Bacteria, the *Times* argued, are inherent to every kind of decomposition, and do not presage any specific disease.

The *Times* is a little behind its namesake. Dr. Koch's micro-photographic researches, with which our readers are familiar, prove distinctly that in the case of specific diseases, specific bacteria are to be found in the animal tissue. This, indeed, was the one link wanting to prove Professor Lister's theory, and Dr. Koch supplied it with his camera. Although bacteria in animal tissue are invisible to a great extent to the eye under the microscope, Dr. Koch has shown it is possible to take their portraits by photography; and he found that their likenesses differed considerably. Thus, in the case of gangrene, that most deadly of diseases, the bacteria are found in the form of globules hanging thickly upon cobweb, like currants or grapes; while in relapsing fever, the bacteria present, are thin hair-like organisms. Other diseases, again, betray the presence of other forms of bacteria, so that, the *Times* notwithstanding, the presence of bacteria does not appear to be merely adventitious.

The private view of the Royal Academy is to-day, the press view having taken place on Wednesday. An afternoon's inspection of the pictures shows the same paucity of good poses in portraiture upon which we have before laid stress. Next week we will print our notes on the posing and grouping of some of the principal exhibits. Mr. H. S. Marks, R.A., and Mr. Henry Moore, the jurors at the last Photographic Exhibition, are well represented, the latter by a charming stretch of blue water in "Mid Channel," the former by three pictures, of which the most taking is "Author and Critics"; a writer, manuscript in hand, is declaiming with out-stretched arm, while two critics, an old man pulling his grizzled moustache in doubt, and a young one in fashionable attire lolling on a table smoking, listen each after his habit. It is a group well within the scope of photography, and therefore worthy of study by photographers.

The late Lord Beaconsfield had a strange aversion to entering a photographic studio; indeed, it is very likely we should at this moment have been without any photograph at all of the distinguished statesman, but for the intervention of Her Majesty. Unlike Mr. Gladstone, the late ex-Premier was very chary about sitting, and we believe that only two good portraits of him are in existence—that of Mr. Jabez Hughes, and of Messrs. W. and D. Downey. The Earl was something of an exquisite, even to the last—those who remember his daily promenade along Whitehall when Premier, leaning on the arm of Montague Corry, know this—and there is little doubt he feared the impartial eye of the camera.

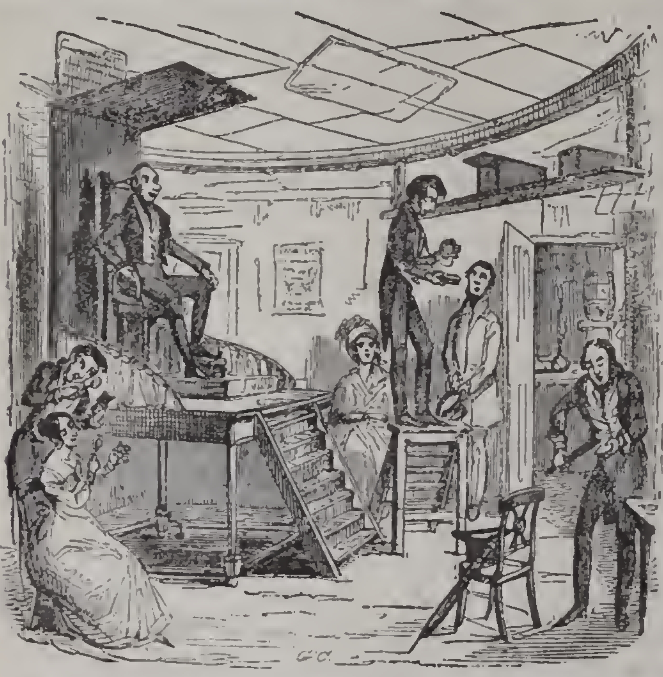
Mr. Hughes secured Earl Beaconsfield's portrait when the latter was on a visit to Her Majesty, some summers ago. Mr. Hughes, who is photographer in ordinary to the Queen at Osborne, was "commanded" to attend—there is a smart little waggonnette, standing ready "on Her Majesty's Service," in a position to be run over from Ryde at a moment's notice—to take pictures on the occasion. There was merry-making at Osborne House, a lawn-tennis party, in which the young princes of Wales took part, in the sunny grounds that overlook the blue waters of the Solent. It was then that the opportunity presented itself, and that Mr. Hughes secured the only portrait ever taken of Lord Beaconsfield.

The photograph of Mr. Disraeli by Messrs. W. and D. Downey, in the well-known velvet jacket, is a no less memorable portrait. This also was secured under difficulties, and we have already told the story of its production in these columns. Mr. Disraeli was at Balmoral Castle at the time, and it required some persuasion on the part of Her Majesty to induce her first Lord of the Treasury to sit. An azure blue coat and light trousers was the costume chosen by the unwilling sitter, and although the Messrs. Downey did their best, they did not succeed. Next day he came in his glossy velvet jacket; unfortunately it was raining, and his anxiety to prevent the new garment from being spoilt with the rain in the improvised studio, as also the dullness of the weather, again prevented the taking of a good portrait. To ask the illustrious statesman to sit a third day was more than the Messrs. Downey dared. There was the Premier still at Balmoral, walking about the grounds—but who was to catch him? At last, on Lady Churchill plucking up courage to approach, Mr. Disraeli sternly vouchsafed another five minutes—five minutes which have probably been worth five hundred pounds to Messrs. W. and D. Downey.

But Lord Beaconsfield had no objection to be painted. In fact, he was rather anxious about being pourtrayed in oil. Mr. Millais asked him to sit, and told him he could paint him in five sittings, of an hour each. Three sittings had already taken place before the Earl's illness, but on the 21st of March, he said to Lord Barrington, "Write and tell Apelles I cannot sit to him to day." The portrait has now been finished; we saw it at the Royal Academy on Wednesday, and a very unpleasant portrait it is.

The addition of glycerine to the oxalate developer, writes Dr. Liesegang, keeps the shadows remarkably clear. Glycerine appears to work more energetically than one-tenth the quantity of bromide of potassium. Five drops of glycerine added to fifty cubic centimetres of developer (without bromide) keeps the clear glass in a negative perfectly free from deposit, even under the most prolonged development.

We make another quotation from Cruikshank's *Omnibus*, this time of a pictorial nature. It is probably the only picture we possess of a studio of forty years ago; the great point, apparently, was to have the camera and sitter as high up as possible, for the apparatus is seen on a shelf just under the roof, and the sitter has to ascend no less than nine steps to his pedestal and posing chair.



One assistant is shown, watch in hand, timing the exposure, and another seems engaged in burnishing a silver plate. Two pair of sitters are waiting their turn, impressed, meanwhile, with the wonders of Daguerreotypes. The head-rest is much the same as that employed now-a-days, and to the head-screen is attached a cord by which the top-light may be modified. A peep through the door shows us the laboratory adjoining, in which a spirit-lamp suggests the mode of development.

Below Cruikshank's picture is a quotation from Shakespeare's Henry IV., more apt, we think, than any yet appropriated by photographers to illustrate their calling :—

> "Sit, cousin Percy ; sit, good cousin Hotspur."

Photographers—and amateurs especially—should look after their drying boxes. We have just heard of a studio being burnt to the ground through the taking fire of a cupboard for the desiccation of gelatine plates. There was but a small Bunsen burner in the chimney, but this seems to have caused the catastrophe. It would be well if chimneys were constructed so that the flame could always be seen ; hidden fire is always dangerous.

Topics of the Day.

SOLUBLE BROMIDE IN GELATINE EMULSION.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

It is not generally known—or rather, I should say, it is generally overlooked—that silver bromide is soluble in a soluble bromide such as of potassium, and that this has a considerable effect in the preparation of gelatine emulsions. A small experiment may illustrate this to good purpose. Take five grains of silver nitrate in solution, and add to it enough bromide (say of potassium) in solution to just convert the amount into silver bromide, carefully pour off all the superfluous liquid, and wash two or three times by decantation, leaving it finally free from water as possible. Next take twenty grains of potassium bromide and dissolve in a quarter of an ounce of water and add it to the silver bromide, and warm over a spirit lamp or Bunsen burner. It will be found that a large proportion of the silver bromide is dissolved, the liquid taking a slightly yellowish tinge. Decant a portion of the liquid into a warmed test tube, and allow it to cool gradually. It will be found that yellow reflecting crystals are deposited, which under a magnifying glass, take definite forms. When these are collected and dried on filtering paper, their true nature can be determined. If some be shaken up in cold distilled water, it will be found that the crystals disintegrate, and that potassium bromide is left in solution. The silver bromide, however, left behind is of the colour which is seen in gelatine emulsion after prolonged boiling. Does this throw any light on the subject of gelatine emulsions? I think it may do. I have held until recently that any excess of soluble bromide over that required to combine with the silver nitrate is injurious to sensitiveness. My views are inclined to be modified, however, by experiments, which have been carried on during the last month. I am inclined now to the belief that a fair excess of bromide will rather increase the sensitiveness than otherwise, more particularly by boiling with a small quantity of gelatine. Now, the action of the ammonia seems to be, as has been recently pointed out, to dissolve the silver bromide and then deposit it, and so on till the particular kind of bromide is arrived at which has fair sensitiveness.

Ammonia cannot, however, be used with a boiling solution of gelatine, since fog must in that case eventuate through the reaction of the ammonia and gelatine on the silver bromide, and an increase in temperature to get a specific reaction is, as we know, most desirable—nay, necessary—if we wish to get it complete. Soluble bromide dissolves in proportion more of silver bromide than does ammonia, and soluble bromide can be boiled with impunity with gelatine. If we may presume that the modification of silver bromide formed by the hot soluble bromide is the same as that produced by a perfect reaction with ammonia, then a better result should be obtained with it than with simply cold digestion with ammonia. Now what are the facts of the case? Some six weeks ago I made an emulsion in which, through an accident, I used 150 grains of soluble bromide instead of 120, using 200 grains of silver nitrate, with the result that a much more sensitive plate was obtained than formerly. Every emulsion made with the same formula gave the same result, and it was this which set me thinking as to the cause of this increase. I cannot lay it down to anything else, and, judging from the experiment quoted, I am bound to accept it if no better explanation can be furnished. In the old days, as we are aware, collodion emulsion was made with an excess of bromide, with the result that it was much less sensitive than when prepared with an excess of silver. In this case the boiling process was not adopted, and therefore the reaction, as before stated, was necessarily incomplete. At the same time, it must be remembered that collodion emulsion had to ripen before it became sensitive, by putting it aside for so many hours. It is probable that boiling the collodion mulsion with excess of bromide (as I do with my special form of emulsion) would produce better results than cold emulsification, and it will be my business to make careful experiments on this point, and also on several others which presented themselves in the course of experiments, and I hope to have shortly some more words to say on the subject. Should it finally prove that the theory propounded is correct, the use of ammonia will be avoided, and with it the danger of producing fogged emulsions. It will be, however, of great interest to determine the excess which ought to be employed, since there is no doubt that unless the elimination of the soluble bromide during the washing is tolerably complete, a product is produced which is highly insensitive to radiation. My present opinion is that about one-fifth excess will give excellent plates, but I should be glad to hear practical results from others.

The " Topic " next week will be " Landscape Studies," by H. P. Robinson.

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No 2.—The Lisping Lady and Her Cat.

It is twelve or eighteen months since a smart correspondence took place in the Photographic News *in re* provincial photographers advertising the working of dry plates as their own particular "instantaneous process." As a rule, I have no hesitation in asserting that it was third-rate photographers who resorted to this mode of covering themselves with a borrowed glory, and at the same time, I have no doubt, increasing the weekly takings of the studios. Many photographers think that the greatest weekly amounts shown on the books testify that they are the most business-like men, and, consequently, the best photographers in the town or city to which they belong. I allow the first, but repudiate the latter. Their business tact teaches them that every trick to secure the L.S.D. is fair in trade as well as in love or war. A friend of mine quarrelled very lately with a party through the fact that he would not consent to use the "double quick process," or "dummy" the sittters, and take their money; in plain language, make a sham of taking them after it is too late. Of course it can be argued that this is only a means of securing a sitter; but, in my mind, it argues small confidence in the excellence of their work, for good work will ever secure sitters, without having to resort to such fishy tricks.

It was when the local papers were teeming with Brown, Jones, and Robinson's *own* "instantaneous processes," that on a dull December morning I was visited by a lady. There was nothing remarkable in that. She was stout, middle-aged, and covered from head to foot in a huge ulster. Still nothing remarkable. But her face! Aye, there's the rub! It was massive, and as immovable as the Sphinx. Indeed, a stony, wooden, one-coloured face that filled you with a religious awe, and sent your mind wandering among saints and martyrs. I remember, in my childhood, gazing with something of the same feeling upon a print of St. Bridget clasping a skull, and turning up her eyes to a small grating above her head, evidently trying to see it without inconveniencing her neck, with such another face as this lady—a face with less expression in it than you will find in an apple dumpling.

But she speaks, and the spell is broken.

"Mithter a—a Whatth-ith-name, do you take picturth by the inthantaneouth proceth!"

Yes, she lisped! and lisped solemnly, with not a muscle of her face moving but her lips. Before I could answer she had commenced again: "Becauthe if you don't, I thall go thomewhere elth. But if you can, I thall have Jummbleth photographed. Do you thee—thee?"

Yes, I saw—and understood, and if the lady would bring Mr. Jummbles (I had some vague thoughts that he might be a clown) at noon next day, I should keep the time open for them. After stolidly viewing the specimens, she made me a most stiff and solemn obeisance, and departed, with a promise to call at noon next day.

What's in a name? A good deal, I think, especially such a one as Jummbles. Who ever heard of such a name outside a travelling show? I puzzled myself to think what relation he could be to her. I tried it on her husband—her father—her grandfather—but it would not fit. Just as I was falling to sleep, a bright idea woke me up It must be a nigger! Yes, "Jummbles" would become a nigger capitally! And I fell asleep delighted with the sharpness of my penetration.

Noon; and my Sphinx appeared, followed by a maid carrying a small hamper. I look anxiously around for Jummbles, the nigger, but fail to see him. The voice lispeth in Sphinx, and I am implored to make a good job of him; I am likewise asked if I am ready, and, if so, to show the way to the glass room at once. I was mystified, and had it not been for the grins of the rosy-cheeked maid, I believe I would have felt the same as the Egyptians of old when the original Sphinx used to ask them riddles. But this mystery was soon solved. On reaching the glass room, the maid opened the hamper, and—"me—au!—me—au!" there, crushed in a heap, was a long-haired white Angora cat. This was Jummbles. I say nothing about my penetration now.

"He's got a littled rumpled!" quoth the maid.

"Wants ironing out," whispered the grinning 'prentice at the dark room door.

"The comb!" demanded the Sphinx. The maid handed her a larged-toothed piece of comb, when she commenced doing up Mr. Jummbles, phizzing all the time like an ostler scrubbing a horse. When this operation was over, and after petting and purring, stroking and lisping at him, she lifted him upon the covered table that I had placed all ready, then turned to me with that immovable massive face, and ejaculated,

"Mithter, a—a! Do you thee that cath's peculiarity?"

I had been standing carelessly beside the camera, wishing in my heart the job well over; but upon being thus appealed to, I marched up and scrutinized Mister Jummbles critically—indeed, I looked very minutely for his "peculiarity," but failed to discover it. I was beginning to get hot, when it struck me that it might be the length of his hair.

"All Angora caths have long hair," reproachfully ejaculated Sphinx. "But obtherve the length of thith oneth tail,"—most solemnly. "The peculiarity of Jummbles is the length of hith tail."

She then gave me particular instructions how to show off that member to the best advantage, supplementing them with a piece of advice gleaned from an experience of a former trial to photograph Mr. Jummbles. I must not touch him, or he would fly at me, "ath he hateth thrangerth;" I must not speak to him, or he would speak back; I must not shake any clothes, or ring bells, because that would frighten him. Then what on earth was I to do? That was my business, she told me. Did I not say that I could take pictures instantaneously? Well, then, what did I mean? She hoped that I would succeed—at least, she felt certain that I would succeed better than the artist who had last attempted to photograph Jummbles. He could not have succeeded worse. When she showed them—the pictures—to her husband, he looked at them wonderingly, tried them every way—this side, and that side, and, finally, upside down—and then gave it as his opinion that it "wath not a cat, but a night-mare."

All this lisped in monotonous tones by the stony Sphinx, the maid grinning over her shoulder, and Jummbles lifting his prognosticating nose, and sniffing around in a most suspicious manner; then, to cap it all, the Sphynx seemed to have a bad memory for names, and apostrophized me as "Mithter-a-Bradlaugh" or Bradshaw! then Bagford—Bagshaw—Badford—every name but the right one, much to the delight of the assistant in the dark-room. It was all very ridiculous and provoking—still, business had to be done. Having seated the Sphinx, and cautioned the maid to behave herself, I commenced operations upon "Jummbles." That interesting animal had discovered by this time that there was no immediate attempt intended upon his life, and had curled himself up for a nap; but he had likewise curled his tail round his fore paws. The Sphinx, when she observed this, rose in considerable agitation, and straightened it out. No sooner had Sphinx seated herself than Jummbles curls it snugly up again. Then Sphinx would speak to him—pat him—kiss him—straighten it out once more, and behave in a more maudlin manner towards the brute than any young mother over her first-born.

I cannot tell you all the humbug I went through; but I may state that I had two hours of it good, and was beginning to feel as a murderer might feel before the deed. I was all the more enraged because by my own mismanagement I spoiled the first half plate. Neglecting to take into consideration that I had a white subject and a short exposure, I used the usual proportion of pyrogallic, ammonia, and bromide, the result being a dense blotched picture lacking in detail. I had succeeded in obtaining sharply defined pictures—one position like what the Sphinx required, and another after my own idea—and then to spoil them! What I should have done I daresay every one knows, yet, for the benefit of any beginner, I may state that I should have reduced the quantity of my pyrogallic one half; this would have prevented the density: and I should have increased the quantity of ammonia, which would have brought out the detail; the restrainer to be used the usual way. The result would have been two rich soft pictures at the first shot. Having lost that chance, and remedied my developer, it pleased Jummbles to get restless; he wagged his precious caudal appendage, and spoiled one plate; he me-auwed, and spoiled another; he moved, he winked, he licked his paws, he washed his face, and behaved in the most tantalizing manner. I smelt my dinner, I knew it was getting cold, and I resolved to make some of them do, but the stony stare of the Sphinx awed me. I felt convinced that she read my thoughts.

At last, two first-rate pictures!

Angry, sour, and as cross as two sticks—albeit my smiling face did not say so, for I can "cry content to that which grieves me most"—I stood and watched the Sphinx give Mister Jummbles a tit-bit of raw steak that she had brought to give him "if he wath a good boy!" I could not help remarking, "You seem very fond of your cat, Madam?"

She slowly turned the large stolid colourless face towards me, looked at me with her round grey eyes, and slowly ejaculated, "Ith my dead boyth cat!"

What I thought or felt at those words I leave you to guess. They were the last she spoke to me. After giving her order, she made a sweeping bow, more to the specimens than to us in the room, and departed.

But I had read the Sphinx's riddle.

SOME REMARKS ON THE NATURAL CAMERA, AND ON UNCORRECTED LENSES IN PHOTOGRAPHY.

BY CAPTAIN ABNEY, R.E., F.R.S.*

In the *Philosophical Magazine* of last month, Lord Rayleigh has a paper which in its bearings is full of interest to the photographer. It is, however, rather full of mathematical formulæ which photographers, as a rule, had rather not read, and I have, therefore, thought it might be well to take the pith of the matter and lay it before the Society. Rays of light, as we are well aware, consist of undulations in the ether; and if we had a thoroughly mono-chromatic light, such as blue, or the photographic light *par excellence*, we should be able easily to calculate many formulæ which at the present time are of extreme difficulty, since in the case of mono-chromatic light we should have rays of one wave-length, while in light generally we have rays of very variable length. A ray of light emanating from a point may be supposed to propagate itself in a sphere, and therefore when it reaches a plane at right angles to its general direction, some parts of the front of the waves will reach the plane after the others; if, therefore, instead of a pin-point for a source of light we have an aperture, we may suppose this aperture to be made up of pin-points, and independent waves to come from each. Lord Rayleigh has shown, when the arrival of any of these spherical waves is only $\frac{1}{4}$ of a wave-length behind another part in reaching a plane, that definition is not deteriorated. Suppose r be the $\frac{1}{2}$ aperture or hole, and f the distance from the plane, and λ the wave-length in inches, he shows that when $f = \frac{2r^2}{\lambda}$ the definition will be as perfect as when a lens is used, so far, I suppose, as diffraction-phenomena are concerned.

Let us take an example of blue light, which has a wave-length of about $\frac{1}{57000}$ of an inch, and calculate at what distance, with an aperture of $\frac{1}{8}$ of an inch, the definition would be as perfect as with a lens. In this case we have to find f.

$$f = 2 \times (\tfrac{1}{16})^2 \times 57,000,$$
$$= 445 \text{ inches, or } 37 \text{ feet.}$$

An image of the sun, thrown from that distance, would therefore be as perfect as if a lens were used.

Suppose we wish to find what aperture we can employ for a 10-inch focal length, we proceed in the same way:

$$10 = 2r^2 \times 57,000,$$
$$r^2 = \tfrac{5}{57000} = \tfrac{1}{11400},$$
$$r = \tfrac{1}{107} \text{ of an inch.}$$

The diameter of the aperture must therefore be about one-fiftieth of an inch to secure good definition. Let us compare this with the diaphragm of a lens used. The smallest aperture of a rapid rectilinear lens is about $\frac{1}{3}$ of an inch; the necessary exposures in the case of the aperture of one-fiftieth of an inch, and with this stop, would be as 2,500 to 10, or 250 to 1. With a gelatine plate such an exposure in certain cases would not be inadmissible; for if a landscape required two seconds' exposure in the one case, it would only require about 8 minutes in the other—an exposure not exceeding that often given with old slow dry plates.

In the classical paper of Petzval on the camera-obscura, which appeared twenty years ago, he shows that it is useless to diminish a hole beyond the one-sixtieth of an inch, and he states that a point with his aperture would be represented by a circular disc of one-twenty-fourth of an inch. This is true, but requires explanation. The illumination at the centre would be far stronger than at the rim of the disc; in fact, it would fade off to nothing at the circumference. It is probable that a point would be represented more nearly by 1-100th of an inch, together with the diameter of the hole; the diameter of a disc representing a point would therefore be 1-100th + 1-50th $= \frac{1}{33}$ of an inch, which is not more than a good lens often defines at parts of an image.

Another remarkable point in Lord Rayleigh's paper is the comparison between an achromatic and an uncorrected lens. He shows, as before, that if an error in place of the wave-length amounts only to $\frac{1}{4}\lambda$, λ being the wave-length, μ being the refractive index of the glass for the red, and μ_1 that for the violet, and f and r the focal distance and radius of the aperture respectively as before, that $\frac{\mu_1 - \mu}{\mu - 1} = \frac{\lambda f}{2 r^2}$. He takes, as an instance, crown glass, in which $\mu = 1{\cdot}5136$ and $\mu_1 = 1.5284$, and shows when $\lambda = $ 1-40,000th, and the aperture of the lens is 1-5th of an inch, an achromatic lens has no advantage over an uncorrected one. It therefore, in cases of necessity, becomes possible to use an uncorrected lens—a point of no small importance. The aperture of a lens may be curtailed, as usual, by means of a central stop placed in front of the lens, or by covering the lens itself. The curvatures of the lenses, of course, have to be considered; but practical experiment has shown that an uncorrected lens of the plano-convex shape can be used when the aperture is restricted. I have myself tried a plano-convex crown lens, of 24-inch focus, on a plate 6 inches square, and photographed with it. The image was first focussed as accurately as could be, by means of a magnifying arrangement looking through a piece of plain glass instead of on ground glass. With an aperture of 1 inch, the image was strongly coloured; and not till an aperture of $\frac{1}{4}$-inch was placed in front of the lens did the colour disappear, and the photograph showed perfect focus.

---

* Read before the Photographic Society of Great Britain.

I may here remark that the focus of the image is best attained by substituting for the plain glass a green glass. By so doing the red ray, and part of the yellow, are cut off, and the general focus is taken up nearer the blue.

If we calculate this, we must first consider what focal distance would give a sharp image in the natural camera, and then multiply that by ·0142, according to Lord Rayleigh.

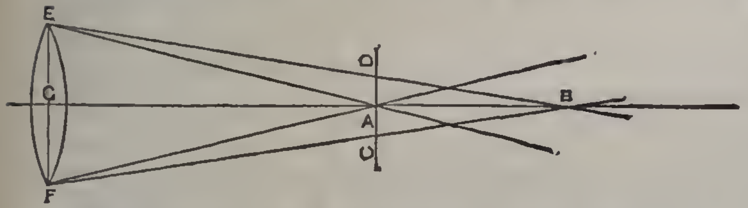
$$f = \frac{2r^2}{\lambda} = \frac{2 \times (\frac{1}{8})^2}{\frac{1}{57000}}$$

$= \frac{2}{64} \times 57{,}000 = 1{,}800$ inches, nearly, for the natural camera;

$\cdot 1800 \times \cdot 0142 = 25 \cdot 5$ inches, nearly, for the uncorrected lens. Theory and practice seem to agree very closely in this matter.

In Petzval's communication, to which I have already referred, he shows that with crown glass the focus for the violet ray is ·036 times the distance of the focal length for red rays nearer to the lens. Suppose, then, we took the focus for the yellow ray, which would be about half-way between these points; let us see what the dimensions of a point would be.

I am not suggesting this as doing away with achromatic lenses,—far from it, they are indispensable; but when a very long focus for a plate, say 9 by $7\frac{1}{2}$, is required, it may be of use to get an ordinary spectacle-lens, costing 1s., and put a diaphragm in front of it, or even to paste up all the lens except $\frac{1}{4}$ inch of it. The focus for a distant plane for the central part of a lens lies in the sphere of a radius of $\frac{3}{2}$ of the focal distance. Suppose we simply stop out the spectacle-lens of 24-inch focus to $\frac{1}{4}$-inch aperture, and then the sphere of focus will have a radius of 36 inches. The question then is, how far off true focus will different parts of a flat plate be, suppose the section of the sphere to be cut by a 9 by 7 plate; that is, if the best visual focus will be at 3 inches from each end? The question arises whether the centre and ends will be in good focus as well.



Let B be the focus of the yellow ray, and A of the violet. Then, supposing the lens has 24 inches focus for the yellow ray, then A would be nearer to B by $\frac{24 \times \cdot 02}{2} = \cdot 48$ inch. C D would be the diameter of the image of a point, putting on one side all diffraction-phenomena. E F is $\frac{1}{4}$ inch; E G is $\frac{1}{8}$ inch.

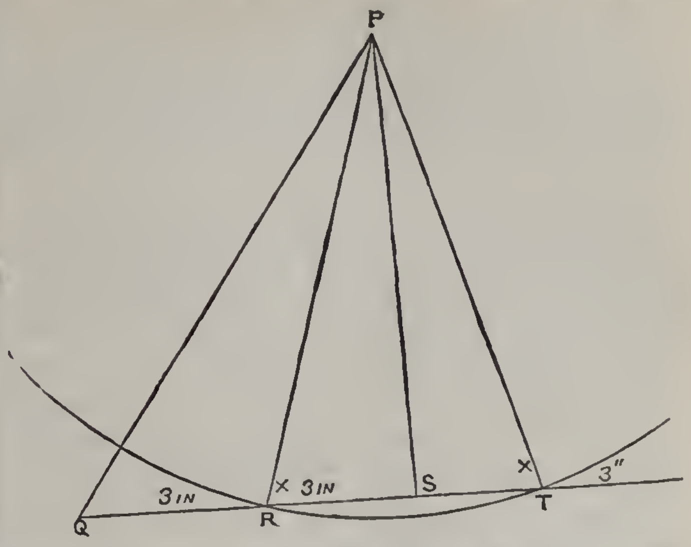
$$E\,G : A\,D = B\,G : A\,B$$
$$\tfrac{1}{8} : A\,D = 24 : \cdot 48$$
$$\text{Or } A\,D = \cdot 002 \text{ inch.}$$

Or the disc would have a diameter of 4-1000th of an inch. The admissable disc of confusion is taken at 1-100th of an inch. It is therefore well within this limit, even when diffraction is taken into account. Such a small aperture would be inadmissible with a slow plate; but for a gelatine plate it is quite manageable to use a stop of aperture $\frac{f}{96}$.

We have seen that R T are already in admissible focus; the question is about S and Q, for if these be in focus the intermediate points will be so as well.

$$\text{If } P\,R \text{ is } r,\ P\,S = \sqrt{r^2 - R\,S^2} \text{ and } P\,Q = \sqrt{P\,S^2 \times Q\,S_2}$$
$$\text{In our case } r = 36\ R\,S = 1 \cdot 5 \text{ in. } Q\,S = 4 \cdot 5$$
$$\therefore\ P\,S = \sqrt{36^2 \times 1 \cdot 5^2} = 35 \cdot 95$$
$$P\,Q = \sqrt{36 \cdot 03^2 + 4 \cdot 5^2} = 36 \cdot 19$$

At Q the disc of confusion would be of a diameter of ·008, and at S it would be of a diameter of ·005; so that the whole of the plate would be well in focus.



If the aperture or stop were placed in front of the lens, as in ordinary single lenses, the focus would be even better than that shown. A little further calculation would go to show that any object within 25 feet of the lens, and in the horizon, would be found depicted in fair focus that is, the disc of confusion would be 1-100th of an inch. It may be asked if lenses of shorter focal length could be used with advantage. The answer to the question is, that they could, if the stop is reduced proportionally. For instance, an uncorrected lens of 12 inches focus would be used with an aperture of—

$\frac{\frac{1}{4}}{\sqrt{2}} = \frac{1}{4} \times \frac{1}{1 \cdot 41} = \frac{1}{5 \cdot 64}$, or about $\frac{1}{6}$ of an inch in diameter, to give the same result; but when you narrow the aperture much beyond this the diffraction begins to interfere seriously, and should be avoided.

I have strung together these few remarks to call attention to a subject which has escaped prominent notice. Lord Rayleigh has done good service in calling attention to it for telescopes, and it appeared to me that it was equally applicable to photographic lenses.

Correspondence.

THE HEAD-REST.

Dear Sir,—Many photographers are discarding the silver bath, owing to the increasing reliability of the prepared plates; and some go so far as to advise the throwing aside of the head-rest as useless or unnecessary, owing to the shortness of exposure required now-a-days.

If our sitters came to us perfectly self-possessed, and perfectly at ease, and could make themselves perfectly at home in our studios during the short time they can give to a sitting, we might then talk of dispensing with the head-rest; but not until then. Certainly, in the case of very young children, we may dispense with the "rest;" but then they are frequently more at home with the artist who professes to take children than their great uncles and aunts are, when their turn comes to sit in front of the camera. In the case of an average sitter, I should advise a careful use of the "rest," and then stop down the lens with a small diaphragm, and thus produce a very sharp picture with a moderate exposure: taking advantage of the quickness of the plate to produce a superior result.—Yours truly,

An Old Photographer.

LOCAL PORTRAIT MUSEUMS.

Sir,—Would you allow me to suggest that no literary, scientific, or mechanics' institution or society should be without a public photographic album containing portraits of all the fellows or members, whether voluntarily presented by themselves, or paid for by the institution or society; and I even go further and say that the town hall of every provincial corporation should possess a public municipal photographic album containing the portraits of every municipal functionary or notability, present if not past, free to public inspection for the edification of the citizens and town people.—I am, sir, your obedient servant,

Augustus J. Harvey, F.R.G.S.

DEVELOPMENT OF GELATINO-CHLORIDE.

Sir,—In the leading article of your last issue, you mention my name in connection with the development of silver chloride. The facts are not quite as there stated, sodic hydrosulphite not having been used by me in my experiments with gelatino-chloride, but the alkaline pyrogallic developer.

The development of silver chloride is quite feasible with the alkaline developer, provided the vehicle be gelatine, and the chloride in a fine state of division. Collodion will not answer at all, not even with sodic hydrosulphite, which is a much milder or "elective" developer. I used both soluble bromide and chloride as restrainers.

The hydrosulphite developer had not been introduced by M. Sauman at the time of my gelatine experiments; but I tried it at a late date with albumenized paper, sensitised in a nitrate bath, and then washed, and it succeeded perfectly. Alkaline development in this case I found not to answer, and believe the failure may be referred to the presence of silver albuminate.

My impression, before giving up my experiments, was that silver chloride, though easily amenable to the developer, was yet less sensitive to the less refrangible rays. At the same time, however, "cooking" and "ammonia treatment" were not thought of, and no doubt I used the "powdery" form of chloride, and not the "granular" modification experimented on by Dr. Eder: still, his conclusions seem to bear out my idea.

Some spectroscopic experiments would be interesting in connection with this subject. Perhaps Dr. Eder would undertake these at some future time.

It seems to me that colour in reduced silver—no matter which haloid is used—depends more upon the nature of the developer than upon the state of the silver salt, though I quite think that some states of the silver salts will not produce certain colours. Thus the hydrosulphite developer produced, with silver bromide in albumen, a bright brick red; while the same developer with silver chloride in albumen resulted in an olive brown, which transmitted light of purple-brown colour.

Again, with alkaline development of gelatino-chloride I obtained warm blacks, while sometimes with gelatino-bromide, especially with ammonium carbonate in the developer, the result has been of a pure claret colour by transmitted light; at other times ochre tint—a very usual colour with hydrosulphite development of collodio-bromide—mild developers and finely divided haloids seem to produce the brighter and warmer colours.

I may mention that some of my chloride films, when thin, transmitted various coloured rays at different parts—at one part rose-tinted, at another blue rays. These colours were more pure than one generally sees in bromide films, which are said to transmit blue or red rays, as though produced by diffraction.

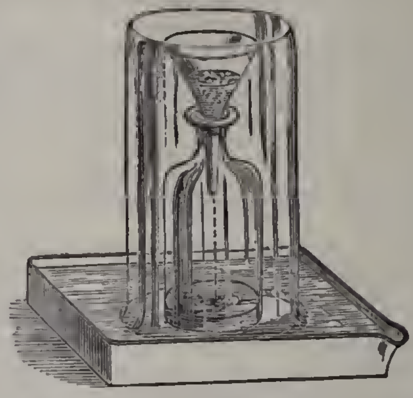
I am surprised that Dr. Eder has not found the hydrosulphite to answer well, as it will hardly affect bromide in gelatine. I presume that Dr. Eder is certain that it neither contained traces of sulphurous acid nor was strongly alkaline.

While, as above stated, I did not look for great sensitiveness in silver chloride, I am yet surprised to find Dr. Eder estimate its comparative practical sensitiveness at one-fiftieth part of that of silver bromide. If the sensitive or "old form" of silver bromide be used, and silver chloride of a similar character, the sensitiveness with weak alkaline developer will be found to be about equal for well-lighted subjects. But, then, Dr. Eder uses a very mild developer. What would be its action upon silver bromide?—I am, sir, yours faithfully,

Herbert B. Berkeley.

COLLODION FILTER.

Sir,—Wishing to filter some collodion, and not having the prescribed filter, I at length hit upon the method shown in the annexed sketch. A developing dish three-parts filled with cold water, a bottle to receive the filtered collodion placed into it, the filter having some cotton-wool placed lightly into the neck, then saturated with alcohol, the collodion poured into the filter, then covered with a thin glass beaker, the water in the dish preventing air being admitted or escaping. This plan may serve for other volatile liquids.



To amateurs like myself, this may be useful.—J. J. M.

[A saturated solution of common salt would be more effectual in confining the ether vapour.—Ed].

GOD OR GODDESS?

Dear Sir,—A pleasant, sweet-worded writer, whose innate modesty forbids him to give any other name than "Free Lance," has in a contemporary kindly taken in hand to point out the error of my ways. This is the third time that his mild and genial pen has, for me, traced the words of wisdom—that his wholesome and friendly wit has sank deep in my untutored soul—that his fatherly hand has been raised in gentle correction—that his sorrowful finger has pointed me out as an unmitgated blockhead. Oh, that such godlike writers should have enemies! What wretch could it have been who once stigmatized "Free Lance" as a "literary clown?" He must have been some son of Belial, some bloodthirsty man who had failed to school his barbarian soul, to govern his unguarded tongue. Photographic clown! Oh, heavens! Yet I envy the boldness of this son of Belial, for verily I am a coward, and must shift the responsibility of the sex of Ganymede to other shoulders. "Free Lance" wittily points out that I have been trying to fly with borrowed plumes, and that in my ignorance I have "spoken of a goddess as a 'he.'" (How beautifully expressive, Mr. F. L.!) Baronius (A.C. 34), L'Morert, Le Clark, and a host of other authorities on heathen mythology, assert that "Ganymede was the son of Tros, King of Phrygia. The poets feign that *he* was beloved, and carried up to Heaven by Jupiter in the shape of an eagle, where *he* was made cup-bearer to the gods;" while Piudar, in his "Olympia," says:—

> "Where since young Ganymede, sweet Phrygian boy,
> Succeeded to the ministry of joy,
> And nectar banquet of the sky."

But of course these authors are wrong!

> "All the worlde is wrong but meddlesome John,
> An' he must be sartingly right."

With regard to the rest of his nicely-worded notice, seeing that it is so free from spleen, abuse, and personality, I treat it with the profound respect with which I have regarded his former lucubrations.—I am, yours ever, Geo. Bradforde.

CLEARING THE FILM.

Dear Sir,—"There is nothing new under the sun." This saying was forcibly brought to my mind on reading the article by Mr. J. Cowell in your last issue. I have by me a sheet of instructions sent out with gelatine plates by Mr. F. York more than twelve months since, and among the "hints" I find:—"Reddish brown film; prolonged development; discoloured developer; discoloured fixing bath. Remedy:—Soak in a solution of citric acid, 5 grains to an ounce of water, or a clearing solution composed of boracic acid, 1 drachm; alum, 2 ounces; hydrochloric acid, 1 ounce; water, 1 pint. Greenish yellow film; over-development. Try citric acid or clearing solution."

Mr. Cowell does not say how his pet formula of citric acid and cyanide of potassium is to be used; he says it "should be made a note of in all dark-rooms." Does he mean that if the gelatine plate worker does not succeed with his development he is to take a dose of "the mixture" as a sedative? If so, would not prussic acid do as well?—Yours faithfully, C. G. CUTCHEY.

[It does not appear that Mr. York recommends a mixture of citric acid and alum.—ED. P.N.]

Proceedings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held at the Memorial Hall, Albert Square, on Thursday, the 14th inst., Mr. **ALFRED BROTHERS**, F.R.A.S., President, in the chair.

Mr. William Headridge was elected a member of the Society.

The **CHAIRMAN** called attention to the proposed art union to be held in connection with the Manchester School of Art, at their new building, Cavendish Street, Oxford Road. Several of the members promised photographic contributions to the same.

The **HON. SECRETARY** then read a paper by Mr. W. Harding Warner, of Bristol (in our next). Accompanying the paper was a stereoscope and collection of slides of large size, with duplicate pictures of the small or original size for comparison.

Mr. **JOHN POLLITT** said he had himself observed the "floating ghost" effect several times when using Dallmeyer's wide-angle rectilinear lens, but the ghost image was always inverted. He had never seen the effect when using a single view lens.

The **CHAIRMAN** said he had on one occasion, when photographing the interior of the Manchester Royal Exchange, managed to get double the number of windows on his plate that there was in reality, the duplicates being some distance from the others, and considerably out of place.

Mr. **JOHN SCHOFIELD** exhibited one of Edison's electric lamps (with the incandescent horse-shoe carbon); and, after he had described it, with some particulars as to cost, durability, and efficiency, an interesting conversation took place, in which the Chairman, Mr. Charles Harris, and others joined.

Mr. **J. W. LEIGH**, calling attention to a method of intensifying gelatine bromide plates with silver nitrate, said that the formula he had adopted and method of use was as follows:—

A.—	Nitrate of silver	60 grains
	Nitric acid	2 drachms
	Water	4 ounces
B.—	Pyrogallic acid	30 grains
	Citric acid	30 ,,
	Water	8 ounces

Mix equal parts of A and B, and flow on and off the previously-wetted plate (as in the wet process). When sufficiently dense, wash, and place the plate for a few minutes in a saturated solution of chloride of sodium (common salt); then wash and fix in weak hyposulphite of soda.

Mr. **JOHN SCHOFIELD** said he had often found that plates which had been developed with pyrogallic acid, but having the appearance of under-exposure and wanting in density, were very much improved by transferring them to the ferrous oxalate developer. By that method he had been able to bring out detail and density which, with the pyrogallic developer, would have been exceedingly difficult, if not impossible. He had also found, in connection with a plate which had been developed with ferrous oxalate, and when fixed was found too weak, that, by applying bichloride of mercury, and redeveloping with ferrous oxalate of potash, the results were very satisfactory, and preferable to the mercury and ammonia intensification.

Mr. **RUSHTON** said he preferred the use of sulphuretted hydrogen after the bichloride of mercury in preference to ammonia.

Mr. **WILLIAM WATTS** exhibited an instrument for viewing lantern slides *à la* graphoscope. It consisted of a metal cylinder with a lens at one end, and an elaborate arrangement for giving tints to the slides fixed at the other end. The whole, mounted on a handsome stand, formed an effective and ornamental piece of apparatus.

A committee to carry out the necessary arrangements for the outdoor meeting was then elected.

A vote of thanks was passed to Mr. W. Harding Warner, and the members then adjourned until May 12, which will be the last indoor meeting previous to the summer recess.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

A NUMEROUSLY-ATTENDED monthly meeting of this Society was held on Monday, the 4th inst., at the Market Tavern, Godwin Street, Bradford, Mr. **E. PASSINGHAM** (President) in the chair. After the confirmation of the minutes of the previous meetings,

A discussion was raised on Mr. W. Harding Warner's letter respecting the exhibition of prints mounted on glass, as to their being in fair competition with those on boards. Several members thought they were not; but the majority ruled otherwise.

Mr. **BULMER** asked the cause of some gelatine plates drying unevenly—some matt, and others bright.

Mr. **BRIDGES** stated that he had previously had great trouble in getting plates to dry quickly with the surface he desired; but, after trying several methods, he had now succeeded so well (by a method he described to the members) that he should never be troubled again. He could now dry them in a fraction of the time previously taken.

Mr. **SYKES** gave the members a formula for intensifying plates by means of pyrogallic acid, citric acid, and silver.

It was then announced that Mr. Garritt would read a paper at the May meeting, and a hearty vote of thanks was unanimously accorded to Mr. Bridges for his highly-interesting and instructive observations.

The meeting was then adjourned until the first Monday in May.

THE PHOTOGRAPHIC SOCIETY OF FRANCE.

A MEETING of the Society took place on the 1st. inst., M **PELIGOT** in the chair.

M. **PERRUCHE DE VELNA** sent a treatise on the reproduction of micro-photographs. He uses a bent microscope, and after focussing the object to be photographed, the objective is exchanged for a photographic lens two inches in diameter, which is fixed in an expanding camera. By this means very large copies may be obtained.

For retouching large carbon pictures, M. **BORLINETTO** recommends the use of the same mixture as required for the preparation of the paper dissolved in water acidulated with acetic acid, and a small addition of a three per cent. solution of chrome alum. When the retouching is dry the print may be washed without harm ensuing.

Dr. **EDER** reported from Vienna on his experiments in conjunction with Captain Pizzighelli, on the addition of hyposulphite of soda to the ferrous oxalate developer. The plates were prepared with bromide of silver, without the slightest trace of chloride or iodide. By a small addition of hyposulphite to the developer, ordinarily prepared, the image appeared much more rapidly. A contrary effect is apparent if the amount of hyposulphite is too great; a clouded image is produced, the development is stopped, and the effect becomes reversed, so that a negative gives place to a bad positive.

M. **DAVANNE** reminded the Society that some time ago he exhibited some very successful specimens to which a small amount of hyposulphite of soda had been added to the developer.

M. **PERROT DE CHAUMEUX** observed that it was the custom for foreigners to publish processes, formulæ, &c., brought out in France, without mentioning the originator, and, after a certain time, the description of process or formula appear in a new work under a foreign name.

MM. **HEICKEL** and **MORIZET** showed some gelatine bromide negatives and prints, observing that the time of exposure required was two seconds, and they became over-exposed with three seconds in the studio, while collodion, under the same circumstances, required sixty seconds' exposure.

M. **GUERRY** exhibited a pneumatic shutter on the principles put forth by M. Jubert and afterwards by M. Audra. The modification consisted not only in the addition of the pneumatic system, which is not a novelty, but in the arrangement of the double slides to allow of the shutter performing three functions. Thus, the two slides may be used together for very rapid exposures (singly for those of longer duration) or the progress of both may be so regulated that the foreground may be exposed longer than the sky.

M. Maudit presented a large collection of instantaneous pictures taken with gelatine plates.

M. Khatissian, of Tiflis, showed a very large number of fine prints taken by M. Kurktschian, photographer, at Erivau (Caucasus), representing ruins in Armenia. They were taken with wet collodion, and under unfavourable conditions.

M. Leon Vidal exhibited for Mr. Morgan four enlargements: two, intended for working up in crayons or monochrome, were sufficiently exposed in ten and twelve seconds respectively; the other two presented a finished appearance after an exposure of fifteen seconds. These were all printed on argentic gelatino-bromide paper.

M. Audra observed that he had experimented with this paper, and it seemed especially applicable for enlargements.

M. Pector, on behalf of the Committee appointed to award the Gaillard prize, reported that, as none of the competitors had completely reached the required results, although the works submitted were full of interest, and gave hopes of future satisfactory solution, the committee wish to prolong the competitions until December 31st, 1881. The same conditions are to be observed, and each competitor should enclose some finished negatives. The Society unanimously agreed to the conclusions of the committee.

M. David stated that for some time he had endeavoured to replace glass by celluloid, but had not been successful in obtaining films of equal thickness and transparency. He first tried rolling, afterwards had recourse to pressure up to 150 atmospheres, and at length used the hydraulic press.

M. Fortier, in answer, said that he had succeeded very well in obtaining even films of celluloid by compression between two heated blocks of wood, pear-wood being preferable.

M. Jonte, in the name of M. Jouniaux, of Liogo (Belgium), presented some gelatino emulsion dissolved in alcohol with a slight addition of acetic acid.

MM. Londe, Vidal, Franck de Villecholle, and Pector, resolved to report on their success with this new emulsion.

M. Audra, who had previously experimented upon it, stated that this emulsion was excellent in working and its results. It spread freely and evenly over the glass, and dried in about an hour and a half in a drying box, under the influence of a current of air. The plates thus prepared proved to be of good medium rapidity. In trying to make the emulsion itself, M. Audra succeeded in obtaining equally good results by dissolving some old dried emulsion in the acidulated alcohol, except that the proportion of acetic acid required to be increased from one to 7½ per cent. to dissolve the gelatine. With another emulsion of English manufacture the results have not yet proved successful. About two years ago, English journals spoke of dissolving the gelatine in alcohol with the addition of a few drops of a mineral acid.

M. Davanne gave an account of a method of extracting silver from useless emulsion. Having a large quantity of old emulsion, he first dissolved it in water, afterwards added some iodised albumen, and then boiled. In a few moments the albumen coagulated and collected all the silver, which was separated by filtering.

After passing votes of thanks, the meeting broke up.

Talk in the Studio.

South London Photographic Society.—The next meeting of this Society will be held on Thursday next, May 5, at 8 p.m., in the rooms of the Society of Arts, Adelphi. A paper by Mr. George Croughton, entitled "A Gossip with Old Friends," will be read, and a lantern and slides, sent for the last meeting by Messrs. Wilkinson and Co., of Suuderland, will be exhibited.

The Photographic Club.—The outdoor meeting to-morrow will be at Epping Forest. It is proposed to take the train from Liverpool Street to Loughton, thence to work in the direction of Highbeech, about two miles. The *rendezvous* will be the Forest Hotel, Chingford (another two miles), at 6.30 p.m.

To Correspondents.

⁂ A cheque for two guineas will be given for the best practical essay "The Way to Preserve Negatives and Register Them." The following rules must be noted:—The article should be from one to two columns in length; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st June, marked outside, "The Way to Preserve Negatives and Register Them." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected MS. In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final.* The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

James Brown.—1. As far as we know, the only mounting material which will fulfil the conditions you specify is india-rubber solution or paste. 2. The use of a smaller stop will not improve matters. The only thing we can suggest is to whiten the stone by rubbing it with a chalky cloth.

S. Smith.—Fuse with two-thirds of its weight of dry sodium carbonate, and dissolve the resulting metallic silver in nitric acid; after which the excess of acid must be evaporated away.

William Peek.—You can obtain all materials and particulars from Mr. G. E. Chapman, 113, Victoria Street, Westminster.

S. A.—Try the citric acid and alum solution, as recommended by Mr. Cowell in our last number.

E. H. M.—1. Hydro-kinone can be obtained from Burgoyne and Co., 16, Coleman Street. 2. About 10s. per ounce. 3. Write to Messrs Goupil and Co., Bedford Street, Covent Garden, W.C.

Fred Turner.—1. Probably some of your hypo found its way into the toning solution. 2. Unless you are dealing with a sufficiently vigorous negative you will find it impracticable to obtain prints having a satisfactory tone.

C. E. G.—1. Procure some flour emery, moisten with water, interpose between two pieces of glass, and work them together until the operation is complete. 2. We should not recommend you to use it for more than three sheets; but it can be made to serve for fixing as many as twelve.

Pyro.—In our next.

F. C. M.—A polished lithographic stone will answer the purpose quite as well.

Joseph Froy.—We have noticed that those portions which dry most rapidly are often brighter than the remaining parts; but it is quite possible that other causes may have been at work in your case.

M. Innes.—There can be no doubt that you have been supplied with an acid oxalate of potassium, instead of the neutral salt. The latter is not usually kept in stock by the ordinary chemist and druggist.

O. M. N.—The pigment you mention is far too fugitive to be adapted for use in printing collotypes. Try alizarine lake.

In a Fix.—A warm solution of caustic potash, one ounce to ten ounces of water, will rapidly remove the deposit.

More Light.—A pair of quick-acting portrait lenses, having an equivalent focus of about six inches, will answer your purpose.

Ralph Tucker.—Rapid oxidation sets in under the circumstance.

Reversal.—Ordinary plate glass is not good enough for the purpose, but by grinding several pieces alternately on each other and polishing, you may obtain sufficiently flat plates for making the mirrors you require.

Cautious.—We are not aware that there is any patent covering the operation in question, and we are inclined to think that any such patent would not be valid.

L. Ramsbothom.—1. The phenomenon is due to the presence of carbonic acid in the atmosphere. 2. An excess of ammonia. 3. About five grains to an ounce.

Triton.—It consists merely of a strong solution of silver nitrate.

Theophilos Pell.—1. You must carefully study and practise the simpler branches of the art of lithography, before you can expect to succeed in a thoroughly satisfactory manner. An excellent manual is published by Roret, of 12, Rue Hautfeuille, Paris, the price being about five shillings. 2. The action is probably due to the presence of a trace of oxidisable organic matter in the air. Look well to the trapping of the drains in your drying room. 3. A very thin coating of albumen spread over the gelatinous coating is a great improvement. 4. Add a moderate excess of ammonia—even a large excess will do no harm.

Advance.—Dry mahogany is the best material to use, and the bath should be put together with hard wood pins and tongues, no nails or screws being employed. Next, saturate with melted paraffin, after which you can line with thin linen saturated with Brunswick black, each piece being carefully squeegeed into position. When dry, revarnish with the black.

J. T. Cook.—1. You had better send the lens back to the maker to be recentred in its cell. 2. About six parts of water.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1183.—*May* 6, 1881.

CONTENTS.

	PAGE
M. Adam-Salomon	205
Carbon Printing for Small Work	205
The Development of Chloride of Silver Emulsion. By Dr. J. M. Eder	206
By-the-Bye—Royal Academy Notes	207
To Take Positives in the Camera Direct. By J. B. Obernetter	208
Gelatine Chloride of Silver Paper. By W. T. Wilkinson	208
Notes	209
Dr. Kenyon's Method of Preparing Highly-Sensitive Gelatino-Bromide	211
Topics of the Day—Landscape Studies. By H. P. Robinson	210
Portable Stereoscope and Panoramic Slide. By William Harder Warner	212
Art and Photography: Suggestions for Bringing Them into Closer Connection. By Herbert B. Berkeley	212
Apparatus for Dry Plate Working. By A. A. C. Swinton	214
Correspondence	214
Proceedings of Societies	215
Talk in the Studio	216
To Correspondents	216

M. ADAM-SALOMON.

It is our sad duty to announce the sudden decease of M. Adam-Salomon. By the time our last number was in the hands of our readers, in which we recounted a pleasant chat "at home with M. Adam-Salomon, in the Rue de la Faisanderie, Paris," the illustrious photographer was no more. On Wednesday, in last week, M. Léon Vidal called at Passy to find the genial artist stricken on a sick bed, and then no hope was entertained that M. Salomon would live beyond a fortnight. Alas! the end came in two days.

It was on Easter Sunday and Easter Monday that we last had the pleasure of meeting M. Adam-Salomon. Although suffering from impaired eyesight, he was then in good health and spirits, and talked hopefully of an operation for cataract which was to bring back to him his strong vision once more. On Sunday, a hot summer's day, he was in company with an old colleague, a doctor of medicine, and brother Chevalier of the Legion of Honour, and during a stroll together in the sunny garden, among the odorous wallflowers and fresh green chestnuts, there was a running fire of gaiety and jokes. They called blithely to one another among the trees, and rallied each other like schoolboys. "Where are you, *docteur?*" cried M. Salomon, lustily, for the doctor had seated himself in an arbour, out of pretence to avoid the artist's raillery. "Where you can't find me," was the other grey-beard's reply. With all the freshness of a lad of twelve, M. Salomon quizzed his friend about his cleverness, whereupon "*docteur*" replied that his hair had not grown white for nothing. "Cheveux blancs," cried M. Salomon, explaining to us what an impostor his friend was; "il est un brun, avec la tête poivrée."

We like to recall the scene now the kindly heart beats no more, not only because it is one of the last and brightest reminiscences of a gifted artist, but because it shows how lightly the threescore years and ten sat upon the shoulders of Adam-Salomon. Everybody knows that he held high rank as a sculptor; but, skilled as he was in the use of the chisel, it was as a photographer that his fame travelled to the four corners of the earth. Strange to say, he did not begin photography till 1861—it was one of the last things, he said to us—and yet, in 1867, at the Paris Exhibition, we find him so far ahead of all other portraitists, that his position was undisputed by his own countrymen, and spontaneously acknowledged in every land. The characteristics of the Adam-Salomon portrait have oftimes been set down. Here is what was written in the News, in 1867, of the Salomon photographs:—

> "They are immeasurably more brilliant than most other portrait photographs we have seen, and we have now compared them side by side with many. They possess not only purer whites and deeper blacks than the great majority of pictures, but they possess more gradations between these extremes. They possess, in fact, a far more extended scale of tones than photographs generally, and as the arrangement and juxtaposition of these tones is skilfully managed, the result is extreme brilliancy. On a closer examination we discover that there is as much delicacy as brilliancy, the most exquisite gradation of half-tone prevailing throughout the whole picture: in the lights, a few touches of very pure intense white, surrounded by an infinity of delicate pearly half-tones of varying depth; in the shadows, deep rich portions of velvety black, but no hard masses unrelieved by reflected light. As a rule, the mass of the picture is in shadow or half-shadow, giving great force to the lights, the effect being exceedingly Rembrandtesque; but the exquisite transparency of the shadows, and the skilful mode by which they are relieved from uniformity of shade, prevents any appearance of blackness or heaviness."

To the *Times'* correspondent was due the credit of having effectively pointed out the pre-eminence of M. Salomon's portraiture, and the photographer never ceased to acknowledge his gratitude. "Can you get me Miss Glyn's address?" was a request he asked of us, as he shook hands on parting. Miss Glyn, the well-known Shakespearian actress, our readers may remember, is the widow of the late Mr. Dallas, who once represented the *Times* in Paris, and M. Adam Salomon desired to register his thanks yet again.

In France, as in this country, there is to be a new Copyright Act, and photographs are, for the first time, to be recognised as works of art by our neighbours. It is mainly M. Adam-Salomon's work that has gained photography the coveted position, for his portraits, the authorities in France have been compelled to acknowledge works of art. M. Salomon referred to this fact gleefully when we last saw him; and it will be, indeed, a lasting monument to his fame when this innovation comes to pass.

◆

CARBON PRINTING FOR SMALL WORK.

It has long been a matter of note that many of those who have from time to time endeavoured to introduce the production of small carbon pictures as a branch of their everyday working operations, have discontinued this class of work after a more or less prolonged period. This is to be regretted, as the carbon picture, when intelligently made, does the most complete justice to any negative that may be presented to the printer, the faintest gradations, not only in the more transparent, but also in the densest parts of the picture, being reproduced with the most extreme fidelity. It is not, however, the hap-hazard carbon printer who can uniformly attain these results; but he occasionally obtains a really good print, which is exhibited with a shout of triumph, and he refers to the negative as one well adapted for carbon printing; while all those which yield a bad result in his hands are condemned as only fit for the silver printer.

The above-mentioned circumstances arise from a very imperfect acquaintance with the peculiarities of gelatine in general, and of bichromated gelatine in particular, and it is to be hoped that the wide-spread employment of the gelatino-bromide process has so far accustomed the photographic world to the peculiarities of gelatine that the carbon process will stand on a new basis as regards its use by the general mass of photographers; and we may hope to see a revival as regards the production of small portraits in carbon.

The very first need in carbon printing from mixed negatives is to adjust the sensitiveness of the tissue to the character of each class of negatives, it being necessary in the case of very thin negatives to sensitize the tissue only slightly, say in a one and a-half, or even a one per cent. bath; while in the case of dense negatives, it may often be necessary to employ a six or six and a-half per cent. solution of potassium bichromate; or, in extreme cases, a seven, eight, or nine per cent. solution of the ammonium bichromate, this compound being much more soluble in water than the potassium salt, and consequently less liable to crystallise in the gelatinous film. There are other ways of adjusting the required balance between the tissue and the density of the negative, as, for example, by varying the proportion of pigment present in the coating of the tissue, a larger amount being put into that intended for thin negatives. This method was carried into practice during the earlier days of carbon printing; but the inconvenience of dealing with several grades or densities of each colour was found to be considerable. Advantage may be taken of the varying sensitiveness of tissue according to its age (after sensitizing) and its hygroscopic condition; tissue which is new and thoroughly dry being especially adapted for use with thin negatives, as it is far less sensitive than samples which have been kept for some days, or which retain a trace of moisture. It should also be remembered that tissue is much more sensitive when slowly dried than when it has been rapidly desiccated.

By carefully carrying into practice the hints above given, the carbon printer may obtain the very best results from any kind of negative which may be presented to him; but there are also certain points which are of general applicability, whether the tissue used is extra-sensitive or not, and which we consider are not sufficiently insisted on, in many cases.

Development should always be effected by water at as low a temperature as practicable, otherwise the film is liable to wash away entirely in the thin parts, or high-lights, the picture being thus irretrievably ruined. A long development at a low temperature is, then, to be preferred to the more hasty operation with over-hot water; and, moreover, by carrying this system into practice, a considerable saving may be effected as regards the time of exposure, a matter of some moment in dull weather.

The drying of the tissue is a most important matter, and it is a point of the first importance that the operation should be performed rapidly, and at a moderate temperature, this being, as a rule, only possible in a room which is itself always kept dry, as an occasional fire in an apartment seldom used, generally serves to draw moisture from the walls, and would rather serve to steam the tissue than to dry it, unless so much heat were employed as to cause the tissue to yield reticulated prints. If tissue is hung up over night in an ordinary kitchen, even after the fire has gone out, it will generally be perfectly dry in the morning; while exposed to a similar temperature in a room only occasionally used might fail altogether to dry the tissue.

◆

THE DEVELOPMENT OF CHLORIDE OF SILVER EMULSION.

BY DR. J. M. EDER.

I see that in the last number of the Photographic News, Mr. Berkeley refers to the research of Capt. Pizzighelli and myself, alluded to in a leader of the 22nd April last. I should have wished that any discussion on the subject could have been postponed until our memoir in full were before the public; but as this is not likely to be the case for some weeks (by reason of its presentation to the Vienna Academy), I cannot leave Mr. Berkeley so long without an answer.

In the first place, I must refer to Mr. Berkeley's opinion that we do not seem accurately to have estimated the sensitiveness of chloride of silver. That, on the contrary, we have very closely studied it will be seen from the following table, which I extract almost verbally from our Academy Memoir of the 13th January.

Sensitive Substance		Necessary time of exposure to bring about a vigorous image		Sensitiveness of the combination.
AgBr, developed with ferrous-oxalate or alkaline pyrogallic	...	1	...	100
AgBr, with alkaline pyrogallic, ferrous-sulphate, and silver nitrate	...	5-7	...	16-20
AgI, ditto ditto	...	4-5	...	20-25
AgCl, with alkaline pyrogallic	...	6-8	...	13-17
AgCl, with ferro-citrate and a trace of hyposulphite	...	10	...	10
AgCl, with ferro-citrate alone	...	50	...	2
AgCl, with pyrogallol alone	...	100	...	1
AgCl, with hydrokinone and ammonium-carbonate	...	150	...	0.7
AgCl, with hæmatoxylin and ammonium carbonate	...	500	...	0.2
Chloride of silver, *without development*, commencement of superficial blackening	...	150-200	...	0.5-0.7

These numbers, as a matter of course, fluctuate in a marked degree according to the concentration of the developer, or to the greater or less amount of soluble chloride contained. It is sufficient here to state that the degree of concentration was that described by us on page 181 of the News for the most important of our developers. In alkaline pyrogallic development the numbers fluctuated considerably, according as bi-carbonate of soda or carbonate of ammonia or caustic ammonia, was employed; with this developer the image often appeared very quickly, but very thin and fogged.

But I found that in order to secure a *serviceable* image upon bromide of silver, an exposure of only one second could be given; whereas to secure a *good and serviceable* chloride of silver picture (diapositive), from 50 to 100 seconds' exposure was necessary; so that in *actual practice* the sensitiveness may be generally considered to be one-fiftieth.

Possibly, however, Mr. Berkeley will not accept figures which compare sensitiveness in actual practice; he may desire a comparison of AgBr and AgCl to be made with the ferro-citrate developer. But it would be just as erroneous if we compared AgBr and AgCl, *both* developed with ferro-oxalate, as if we compared *both* developed with ferro-citrate; for the ferro-citrate developer, although capable of bringing out a latent image upon bromide of silver, would be incapable of sufficiently and thoroughly developing it. Ferro-citrate is not capable of developing a weakly-impressed image, whose presence could nevertheless be amply proved by the application of ferro-oxalate. Of what value, then, would be such a comparison?

For this reason, Captain Pizzighelli and myself sought to solve the problem in another way. A BrAg film, and a AgCl film, were exposed to light under a photometer; then both were immersed for several hours in a strong solution of bromide of potassium, washed, and dried. The chloride of silver was thus completely changed into bromide of silver, and, curiously enough, the latent image, which previously was of chloride of silver, was not destroyed, but changed into an analogous bromide of silver picture. Both plates were now distinctly comparable, and were at once developed in oxalate; it was found, then, that the bromide of silver plate was more sensitive than the chloride of silver plate.

This method may not be altogether free from faults, but it is, at any rate, the most exact at present known.

Our experiments with the spectrum are not yet quite complete; but I can, at any rate, vouch for the fact that chloride of silver is certainly not so "less sensitive to the less refrangible rays" as Mr. Berkeley seems to believe.

Mr. Berkeley's view of the hydrosulphites differs very much from our own. Mr. Berkeley says "it will hardly affect bromide in gelatine." This is not the case in our experience. *Pure*, concentrated, fresh, hydrosulphite of soda acts *very vigorously* indeed upon bromide of silver, and by giving a little longer exposure very good bromide of silver negatives may be developed by its means; so vigorous a reducer is of no use for chloride of silver.

The other remarks of Mr. Berkeley upon our research on chloride of silver are of little importance, and the short reference to our work in the News is sufficient at present for our purpose. But, before concluding, I must point out that Mr. Berkeley is in error when he says it is immaterial which haloid is made use of. Bromide of silver does not, in any way, yield images of such varying colour with different developers as chloride of silver, and this is just the important advantage of our new process.

By-the-Bye.

ROYAL ACADEMY NOTES.

Our attention at the Academy was for the most part directed to two features: a study of the poses of the various portraits, and an examination of such compositions as were within the powers of the producer of pictorial photographs.

If photographers err in posing, they do so in very good company. We have laughed a good deal over photographic portraits with incongruous backgrounds, over hemming in the unfortunate sitter with a plethora of furniture, and employing conventional accessories *ad nauseam*; but the day is not so far distant when sailor portraits were invariably painted with a three-decker in the offing, and the military man had a battle raging beside him or in the distance. Even now we find painters, and artists of high standing, too, like Mr. Frank Holl, A.R.A., as in the portrait of Sir H. Rawlinson (82), crowding in a lot of accessories to intimate the fact, and to stamp upon it, that the model is a traveller. There is but the smallest space available, but still the artist has crammed in a globe, an atlas, and a map or scroll—beside the portrait, who, for the nonce, is interested in none of these things.

A picture near it, a group of children (84), by Mr. E. Hanley, very well illustrates our recent article on "Groups," in which we complained of the tendency of photographers to overdo the incident. Three out of the four children are so terribly busy, that at once you feel sure they are only making believe. The notion of the group is of the crudest: a long brown piano is in the middle of the picture; at one end sits a child intently playing, and at the other, resting his book on the instrument, and oblivious of the loud jangling, is a second child intently reading; a third is intently playing with bricks in the foreground, and the fourth leans against the piano intent on having his portrait taken. There may be art in the picture; there is certainly no nature.

Mr. Millais is at once the most delightful and the most exasperating of painters, so far as his posing is concerned. Nothing can be more easy or unconstrained than the portrait of Sir G. Greenall (86), an old gentleman, painted full face, three-quarter length; the hat is in one hand dropped to full length of arm, the other hand touches the front edge of the coat near the bottom of the waistcoat; or again the portrait of Sir J. Astley (407), in a loose morning jacket, cigar in one hand, and the other in the lower jacket pocket. But, on the other hand, the portrait of Lord Wimborne (972), is about as unpleasant and angular a pose as could well be conceived. One arm stiffly akimbo, forms an upper triangle, while a lower triangle, equally marked, results from a stick upon which the model is leaning, the point of the stick being many inches from the feet. The whole looks like a problem from Euclid, constructed to prove that alternate angles—as we used to call them at school—are equal to each other.

That half the portraits in the Academy have been painted from photographs is more than likely, and that the defective pose is in some cases the fault of the photographer, and not of the painter, we are willing to admit. But surely painters need not follow their photograph studies in every detail, and more especially the unpleasant ones. We should be glad of an assurance that the execrable group of Mr. and Mrs. Tomlin (108), by Mr. Horsley, R.A., is not due in any way to the camera. A more clumsy mechanical bit of posing was never shown—the gentleman looking up aimlessly from a garden seat, and the lady standing beside him, engaged in an equally aimless stare—while beside them is *Punch*, and some addressed envelopes, the details upon which are painted with microscopic distinctness.

Lady Beaumont (202), by Mr. G. A. Storey, A.R.A., a portrait taken full front, with arms and hands crossed, will also teach photographers what to avoid. Another example is afforded by a second portrait, by Mr. Horsley, of the Solicitor-General for Scotland (531). Here we have a very beautiful gentleman indeed, his light paletot thrown open to discover a shining black coat, with red geranium in his button-hole—a capital specimen of man-millinery, but hardly of a forcible lawyer. About as bad as bad can be, too, are the two sailor-boys, by Mr. C. Vivian (472), who with vacant mind and vacant stare, the one sitting and the other standing, have just stolen a bird's nest, evidently for the purpose of helping them to have their portraits taken, but have thought better of it, and so let it be. As a last example of the old conventional posing, we may cite a portrait of Sir E. Bates (296), by Mr. J. E. Williams, the gentleman standing beside a library table, supporting one hand upon it—or, rather, upon a book, because the table is not high enough—and holding a letter in the other hand, neither letter nor book, of course, having any meaning.

To turn from these conventional and meaningless poses—and it is the posing more particularly that we are speaking about now—we may point out some truly delightful pictures that well deserve close examination. Portraits 41, 72, 183, and 218—two girls, by J. Sant, R.A.,—are all of them thoroughly artistic. Mr. F. Holl's portrait of Mr. Holland (451) is successful as a simple standing pose. "The Coral Necklace," by Mr. Storey, A.R.A. is also engaging (470),—a half-length female portrait, the hands so closely clasped behind as to be invisible, a pretty oval face, slightly thrown back in disdain, the neck covered with a deep ruff and necklace. All the more pleasing portraits are half, or, at most, three-quarter length; for painters, no less than photographers, experience a difficulty, especially in the case of male portraits, in finishing off the extremities with effect and grace. Photographers will note how much more successful are the "cut off" portraits than the full-length in this year's Academy.

There are several compositions, within the scope of photography, and interesting, if only from this circumstance. We will mention a few examples:—"Flies" (94), by Mr. E. R. Taylor, a group of four disciples of the gentle art; one evidently practised fisherman is showing an artificial fly, no doubt a "killer," to other two anglers mightily interested in trout and salmon, while a keeper in velveteen stands behind, completing the picture. "A Choice Vintage" (327), by Mr. C. Green, shows two old fellows sitting over their wine, one a straight-backed old-fashioned figure, who is tasting, the other being the more jovial host. "Let Sleeping Dogs Lie" (402), by Mr. Riviere, A.R.A., a sleeping navvy outside a public house, with a sleeping bull-pup upon his body, is another study that is within reach of the photographer. "A Mid-day Meal in the Open" (429), by Mr. Otto Weber, represents a team of tired horses with their nosebags on, resting with the plough behind them at the margin of a field, while the labourers are taking a siesta in the hedge close by. "A Love-test" (876), by Mr. Oliver, would be rather more difficult—a lady standing in a landscape, intent on picking to pieces a big star-daisy to prognosticate her fate. "An Evening with Mozart" (896), by Mr. Hardy, a quartette playing and group quietly listening, is a picture also within the limits of photography.

In "Bound for the Black Sea, 1854," a picture by Mr. Hodson, R.A. (240), the main incident is a travel-stained photographer taking a picture on the quay at Portmouth of a marine and the girl he is about to leave behind him. Is not 1854 rather too early for the peripatetic photographer? It was the date of the formation of the Photographic Society, and when collodion was still an expensive commodity. We doubt if street photographers were general until a year later.

The "At Home" next week will be "MM. Benque et Cie., in the Rue Boissy d'Anglas, Paris;" the following "By-the-Bye" will be on "Publishing."

◆

TO TAKE POSITIVES IN THE CAMERA DIRECT.

BY J. B. OBERNETTER.*

According to my experience, the best results are most conveniently obtained by employing collodio-bromide of silver emulsion. For the benefit of those who have not a good collodion emulsion at hand, I give below a formula for making one, by the aid of which very excellent collodio-bromide plates may be prepared. Gelatine emulsion can only be used with advantage when it contains the smallest possible proportion of gelatine, and provided the plates are quite evenly coated; even then, those parts which in a positive should be quite clear and glassy, always show a yellowish tint, due to the action of the developer in reducing the silver bromide. The new emulsion of Dr. Vogel behaves in exactly the same way as one of pure gelatine.

When a positive is to be taken, the exposure must on no account be too short. A developer must be selected which is best adapted for use with the particular kind of emulsion employed: for instance, a collodion emulsion should be developed with bicarbonate of ammonia. The developing must be continued until the silver bromide in the darkest parts has been completely reduced throughout, an effect which may be observed by examining the plate from the back by transmitted light; fog by transmitted light, or on the front side, is of no consequence.

So soon as the development has reached this point, the plates must be thoroughly rinsed in water; a two to three per cent. solution of chromic acid is then flowed over them. The bromide that has been reduced to metallic silver is by this means rapidly converted into silver chromate, as will be at once recognized by the well-known intensely red colour where the conversion has been completely carried into effect. This chromate must not be entirely removed, which may be done by washing the plate in a little water, and then in a very dilute solution of ammonia. Those parts which were at first opaque and afterwards of a red colour, will now be seen to be perfectly transparent like clear glass, and the other parts will be more or less transparent in proportion to the quantity of silver bromide reduced. The result is a positive image in white silver bromide; to blacken this it must be taken into the daylight and laid in any dilute developing solution. The bicarbonate of ammonia developer gives a particularly good tone, that of Dr. Eder rather a grey one. We may continue the reduction of the bromide until every particle of it is reduced, and then we shall get the greatest depth; but we have it in our power, by interrupting the reducing process at any particular point, to produce a soft or hard positive. Finally, the image is fixed with sodium hyposulphite. This method is very advantageous for obtaining inverted negatives for collotypes from ordinary negatives, either in the same size, or of enlarged or reduced dimensions.

I now proceed to give directions for preparing collodio-bromide dry plates, which are not only especially well adapted for the above purpose, but which, from their great purity, fineness of grain, and reliability, can also be used with advantage in many other cases. Their sensitiveness is slight, so that they require about six times as long an exposure as a wet plate. But this very circumstance adds to the convenience and certainty in working with them, as any dark room fit for the collodion process will serve in this case. A little experience shows that great sensitiveness is often a secondary consideration, and that, in many cases, some other special quality is of greater importance.

Collodion.—Zinc bromide, 5 grains, dissolved in 200 grams alcohol, mixed with 5 grams pyroxyline, and 200 grams ether. When completely dissolved, let the solution settle for two or three days, and the collodion is ready for use.

Silver Bath.—Silver nitrate, 14 grams, dissolved in 100 grams water, and acidulated with a few drops of silver nitrate.

Developer.—Composed of the three following solutions:—

A.—Crystals of ammonium bicarbonate 25 grams, dissolved in 100 grams of water.

B.—Potassium bromide 10 grains in 100 grams water.

C.—Pyrogallic acid 10 grams in 100 grams water.

Preservative.—Equal parts of beer and water heated till the mixture ceases to froth, and filtered.

The above are the requisite materials. A polished glass plate is coated with the collodion, and silvered in the bath as in the usual way, and then well washed in water. After washing, the plate is laid for a couple of minutes in a three per cent. solution of potassium bromide, and again washed in water. After this second washing the preservative is flowed over it twice, and the plate then placed in a vertical position to dry. The developing solution must be prepared just before using, by mixing 100 cub. centim. of the A (bicarbonate of ammonia) solution, 2 or 3 cub. centim. of the B (potassium bromide) solution, and 3 cub. centim. of the C (pyrogallic acid) solution. If the operator be in the habit of working with an iodized collodion rich in bromide, he can use it for this process in conjunction with the ordinary silver bath; but after washing, the plate must be laid in a five per cent. solution of potassium bromide. The preservative and developer are employed as directed above, and good results will be obtained by this means.

---

* *Deutsche Photographen Zeitung.*

◆

GELATINE CHLORIDE OF SILVER PAPER.

BY W. T. WILKINSON.

A silver print is generally looked upon as a very fleeting object indeed, and as, in spite of increased care in manipulation and greater knowledge of chemistry and photography, increased stability is as far off as ever, it would seem useless advocating another silver printing process; but it is an undoubted fact that the silver does not have all the blame of causing fading, which, in the opinion of many, is shared in a great measure by the albumen used.

I would therefore suggest a fair trial of gelatine instead of albumen, retaining the silver and the other salts as in albumenised paper, and from the recent experience I myself have had I am inclined to think there is a much greater chance of permanence with gelatine than with albumen. Unlike the other so-called permanent processes, the use of gelatine chloride of silver does not require a radical change in the way of working. All the manipulations are the same as for albumenised paper, with the single exception of a bath of alum after fixing, to harden the picture and to get rid of hyposulphite. To make the paper, take 2,000 grains gelatine; water, 20 ounces; chloride of barium, 2,440 grains. When dissolved, add 1,700 grains of nitrate of silver dissolved in 5 ounces of water. This makes the emulsion of gelatine chloride of silver, and it is used without washing. Place in a dish which has some arrangement for keeping warm, so that the emulsion may be kept fluid. Saxe or Rive paper may be coated with this emulsion by rolling the sheet face out; place the edge of the roll upon the gelatine, seize the two corners, and slowly lift perpendicularly from the solution; the paper will unrol itself, and take up a thin film of gelatine emulsion, when it may be suspended to dry in any convenient manner. Of course all these operations are conducted in the dark-room.

The behaviour of the paper in the printing frame is precisely the same as albumenised paper. The washing and toning are conducted in the same way; fixing being effected in hyposulphite, 2 ounces; water, 1 pint. For ten minutes after fixing, wash in ten or twelve changes of water, then immerse in alum 5 ounces, water 20 ounces, for five minutes; again wash in a few changes of water, and the prints are ready for drying and mounting.

The last bath of alum will serve a two-fold purpose; first, it renders the picture insoluble; and second, it gets rid of the hyposulphite. The results in my hands, and in those of some of my friends, are everything that may be desired, and if the chances of permanency are as good as at first sight seems likely, gelatine chloride of siler paper deserves a trial, as its prepartion involves no complex operations, or the setting apart of any particular place for its use.

Notes.

Mr. Robert Hunt, F.R.S., the Nestor of scientific photographers, whose works on our art-science date back more than thirty years, and are still acknowledged authorities, has again become an author. "Popular Romances of the West of England," of which two previous editions have appeared, is the title of a work which has for its purpose the recital of legends of "Old Cornwall." "While correcting the pages for a new edition," says Mr. Hunt, "a scientific friend, who was deep in the cold thrall of Positivism, called upon me. He noticed the work upon which I was engaged, and remarked, 'I suppose you invented most of these stories.' This remark appears to render it a humiliating necessity to assure my readers that none of the legends in this volume have been invented. They were all of them gathered in their native homes more than half a century since."

The British Association meets this year at York on the first day of September. Mr. Huxley and Mr. Spottiswoode, the president of the Royal Society, will deliver discourses on the occasion.

The yellow star Aldebaran, Dr. Huggins told us, required an exposure of nearly two hours before it would register its spectrum in the camera. Professor Draper, of New York, now informs the *Academie Francaise* that to obtain his stellar pictures in the nebulæ of Orion, an exposure of no less than 140 minutes was necessary, and this, too, with the most sensitive gelatine plates he could obtain. Any star that can be seen in a nine-inch telescope, Professor Draper can photograph.

The estimation in which the late M. Adam-Salomon was held by the photographic community in this country is well known; but it is not so well known that his position was so highly recognised by the British art world as to cause him to be elected an honorary member of the Athenæum Club during his visit to London in 1870.

It is gratifying to learn that the model in clay of Thiers on which Adam-Salomon was engaged at the time of his death was practically finished before the decease of the sculptor-photographer.

Some of our lady correspondents, however well they may be able to keep their books, have not kept so well to the rules we asked them to abide by. We have no doubt the loss will be that of our readers, but still we have been compelled to put aside several promising articles written on both sides of the paper; we hope to publish the paper of our choice next week.

In an early "At Home" we shall describe a visit to the chief of the detective police in Paris, and recount the features of the photographic establishment at the Préfecture. It is over the Nihilists that the police-photographers in the Rue de Jérusalem are busying themselves at the present moment.

An egg-whisk of white porcelain, from which the metal stirrer had been removed and replaced by glass tubing bent into the same shape, was shown us the other day by an amateur who employs it for emulsion making. Fifteen ounces of emulsion could be made at one time without difficulty in the little apparatus; the warm nitrate of silver is added by means of a small wash bottle, made out of a test-tube, while the whisking is going on.

From Leipsic comes news of a "luminous telephone," the invention of a *savan* in that city. This telephone does not confine itself to transmitting sounds, but reproduces in luminous characters words as they are pronounced; the latter being recorded by some photographic method. But one would like more details before placing implicit belief in this novelty of novelties.

M. Levitsky, the Court photographer at St. Petersburgh, has gone back to wet plates in his electric studios; he avows that an exposure of not more than four seconds is necessary, but he works with a very strong light, which is reflected upon the sitter from all sides.

Dr. Steinheil, of Munich, exhibits a lens of novel construction at the Vienna Exhibition, termed an Antiplanet; it is composed of two lens systems, possessing similar faults and aberration, which are neutralised by their juxtaposition. It is destined both for landscape and portraiture, and is, says our friend Dr. Eder, to be distinguished for great power and depth of focus.

The ceremony of inaugurating the statue of Nicéphore Niépce takes place at Chalons-sur-Saone this month; but the statue itself will not be forthcoming for some time.

The conference of German and Austrian photographers seems to be definitely fixed for the 24th August; it will take place at Frankfurt, and occupy two days.

To that mysterious compound—ozone—have already been attributed many mysterious phenomena. Now, M. Chappuis tells us the blue sky is due to ozone. He and M. Hautefeuille have, at any rate, proved that ozone, when near its condensation point, is of a blue tint.

Topics of the Day.

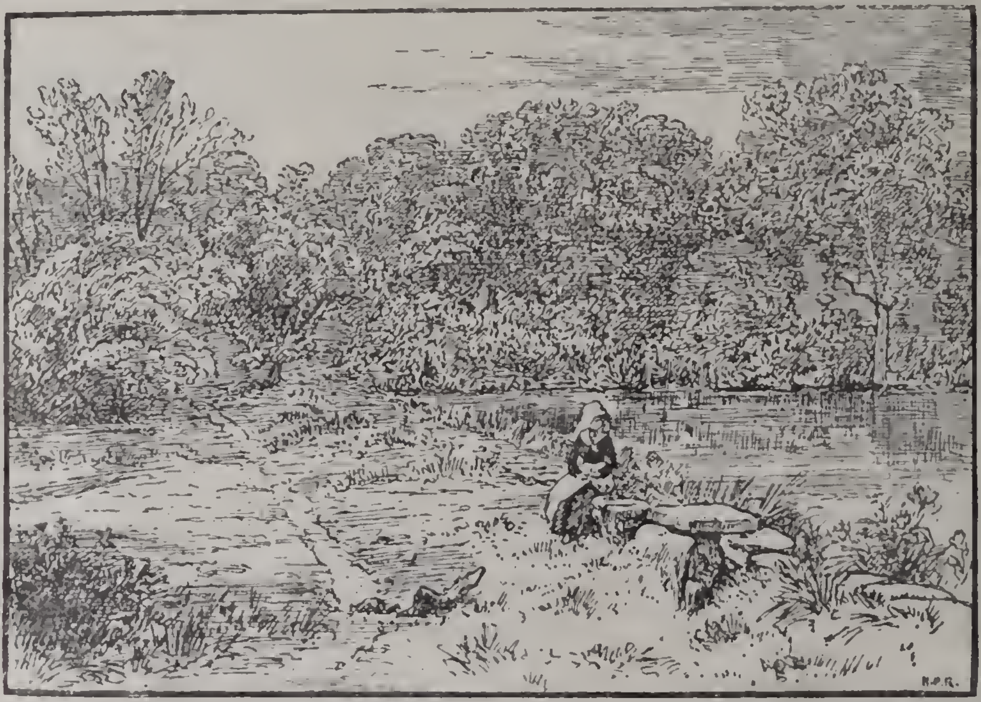
LANDSCAPE STUDIES.

BY H. P. ROBINSON.

No. 2—Figures in Landscape.

A really beautiful landscape photograph, one that is perfectly satisfying to the eye and mind, is very rare—this is an admission I make with the greatest pleasure. So many pictures belong to the dreary order of "might-have-beens;" so many miss by a narrow chance the ray of inspiration that will create a glory even out of an unpromising subject. One of the most depressing of the effects we experience in a photographic exhibition is caused by the prevalence of those pictures which have not quite attained success. Mechanically perfect, clean, sharp, and precise, they lack some subtle quality that is often found in pictures technically poor. Rejlander's works are not yet forgotten, I hope. In them we seldom found what a photographer would call a good negative, yet, in nearly every picture he produced, there was a something that carried it infinitely beyond the ordinary photograph. It is not easy to define in what respect any particular photograph fails to produce the fullest effect that should have been got out of the subject; but it is easy to see that a great deal more could be done to improve landscape photographs than is done, in a variety of ways, one of the chief of which is the proper introduction of figures.

The first thing that strikes one, as a rule, on looking at one of the ordinary run of landscape photographs is, either that it is very much in want of figures, or that those that are introduced are very much out of place and not adapted to the subject. Perhaps more landscapes are spoilt by the misappropriation of the figures than by the absence of them, but this simply proves that the photographer was wanting in taste or knowledge. But, difficult as it necessarily is to get figures that will assimilate with the landscape, they should never be neglected. Landscape without a figure is a suggestion unfulfilled, a fitness unused, an opportunity wasted. The figures should be not only *in* the picture, but *of* it. If more than one is introduced, they should appear to so belong to each other that to separate them would ruin the whole. In a perfect work—a work, however, which I admit is unattainable—it should be impossible to add to or remove from any portion of it. We should, then, aim at producing work that approximates to this condition. If a figure is introduced, it should be felt that this figure gives value to the picture, that it gives importance and support to the composition, and, providing the scene is not of overpowering splendour, that the picture is *made* by the figure. It may look like an accident, but however true it may be that the art should conceal the art, that which to the general public looks like accident should appear to the trained eye as the outcome of deliberate purpose, the result of educated thought, and the expression of subtlest art. A figure, in fact, is often the key-stone of the building upon which the stability of the whole structure depends, and it is this "key-stone" that is almost always taken at random, without any thought or consideration. A figure is too often, indeed, a mere after-thought, stuck in at the last moment, and consisting of any material that migh be at hand. This method of proceeding is entirely contrary to what should constitute good art. Figures should be selected and arranged. It is often possible to find suitable figures on the spot; but this is a mere chance to which the photographer should not subject himself. He may find sailors at the seashore, or agricultural labourers in a field; but it is much better to make arrangements with them beforehand, while, for the usual landscape subjects, it very rarely happens that suitable figures can be found haphazard. It is much better to take your models with you, having first paid particular attention to the dress and general get-up. It should also be decided whether a dark or a light spot is required in the particular position in which the figure is to be placed, also whether any story is to be told, or any title suggested for the picture. Most commonplace bits of nature can be made to yield pictures by proper treatment, especially that of light and shade, and arrangement of figures.



I now propose to give a slight example of how a subject which would be otherwise uninteresting may be rendered pictorial by the introduction of a figure. It is difficult in small wood-cuts or block illustrations to give an idea of photographs, and, in the present illustration, I must trust a good deal to the imagination of my readers aided by description. The landscape consists simply of the deep end of a lake, across which a dam runs, and a screen of trees. In itself there was nothing of which a picture could be made; but the arrangement of the lines, and the breadth of light and shade, suggested possibilities which the judicious photographer should not be slow to seize. The photographer who produced this subject came upon it suddenly, with "arms in his hands." In other words, he had his camera with him, but, instead of taking it at once, he made a careful study of the subject, determined the right time of day, and the right figure for it. On the following day, the weather being suitable, he took his trained model, dressed more picturesquely than the modern rustic, but not conspicuously so, and posed her on the right spot, and exposed his gelatine plate. The landscape, with the exception of the shadows of some stones in the foreground, was almost entirely in half tint, and would have been tame and poor without some point of interest. The figure was, therefore, dressed in black and white, and was made to come out strong against the semi-tones of the rest of the picture. The parallel paths would have ruined the effect if it had not been for the figure, which breaks the line of the upper path, and the dark fragment of tree trunk (which did *not* get there by accident) in the immediate foreground. The device of placing brilliant bits of black and white together, as a most emphatic point in the composition, is here again illustrated, and in the photograph it has a happy effect.

I think I may allow myself here to give the sequel of the story of this picture, although it tells against the photographer, and especially against the maker of the dry plate he used; but it contains, perhaps, as useful a lesson as any other I could give. This photograph never arrived at what might be called exhibition completion. It turned out one of the "might-have-beens," from a different cause to any of those to which I alluded in the commencement of this paper. The scene is about 200 miles away from the photographer's home; he had got a splendid subject, for the addition of the figure had made it a fine subject; his figure was picturesque, a long way beyond the average of picturesque figures; the wind was calm, the light perfect; and yet he confined himself to one shot! Only one plate was exposed! He was guilty of that economical folly which should never be allowed to have its miserable way in photography. When the plate was developed, it turned out an exceedingly fine negative, except in one respect, and that one exception was fatal. The plate had been unevenly coated. The film was thicker at one side than the other; the consequence was that it developed densely on one side, and was approaching transparency on the other where the film had been thin; the picture was, therefore, lost. Yet not lost, perhaps. That photographer knows where the subject is, and he will not hesitate to take another journey after it at an early opportunity, when, probably, he will not be so economical with his plates as on the last occasion: it is also quite certain that the plates he uses will not be by the same maker.

There is another change that may be introduced with advantage in landscapes. The photographer seldom allows his figures to look larger than pigmies. He seems afraid of a figure of any importance, whether in size or pose. There is one good reason why he should not introduce larger figures without effect. Anyway, there are no technical difficulties to prevent him. The employment of gelatine plates has so reduced the time of exposure that the danger of figures moving is very little indeed, and if the precise photographer insists upon everything being in focus, the quick plates give him the opportunity of using a small diaphragm. It was the practice with the painters of long ago to make a great distinction between figure and landscape; it was either a figure picture or a landscape which engaged their attention, and, in a limited sense, I agree with them; but many modern painters—to mention a few, all of them amongst the most popular artists of the day —G. D. Leslie, H. S. Marks, Marcus Stone, F. Walker, and G. Mason—have shown us that very charming pictures might be produced containing important figure subjects, but in which it has not been necessary to sacrifice the landscape. The figures may often be made to tell a story or illustrate a poem or poetic thought. But the consideration of "subjects" will require another chapter.

DR. KENYON'S METHOD OF PREPARING HIGHLY-SENSITIVE GELATINO-BROMIDE.[*]

Kenyon set out with the principle that the sensitiveness of silver bromide emulsion increases continually with cooking, and that it is 'the setting in of fog which limits the attainment of sensitiveness."[†] He recommends, therefore, heightening the sensitiveness by continuous boiling, regardless of the formation of fog, and then eliminating the latter by means of potassium bichromate; the result ought to be an exceedingly sensitive, clear-working emulsion. The great advantage claimed for this method is that the emulsion may be prepared by any kind of artificial light, or even by light of day. In a leading article of the Photographic News,[‡] however, it is stated that the sensitiveness of an emulsion after one and a-half hour's boiling, and then washing in a two per cent. solution of bichromate, is not greater than that of an emulsion boiled only for a short time, and subsequently treated with ammonia; though, as is suggested, the "result may have been due to imperfect elimination of the bichromate."

We repeated these experiments with the greatest care. We prepared an emulsion according to the directions in Dr. Eder's work, "Theorie und Praxis der Photographie," p. 66, and divided it into three parts. The first we used for coating the plates directly, without any further cooking; the second we boiled for half-an-hour, and obtained a highly sensitive and clear-working emulsion; and with the third we continued the boiling for one hour and a-half. Each of these emulsions was then thoroughly washed in water, and the plates were coated. Of these plates, in each case, one was plunged into a bichromate bath for four hours, and the other for eighteen hours, and then both placed in running water for six hours. Although after this treatment a careful chemical analysis showed no trace of chromates, the plates were further washed for thirty hours in running water. All the plates were then dried, and exposed under the scale-photometer by gaslight for sixty seconds, and subsequently developed each for the same space of time with ferrous oxalate. The results were as follows:—

	Visible degrees of the photometer (after fixing).
a. Uncooked emulsion	13
b. do treated with bichromate ...	7
c. Emulsion boiled for half-an-hour ...	19-20
d. do treated with bichromate ...	13
e. Emulsion boiled for one and a half hour (highly fogged)	2
f. do treated with bichromate (not so much fogged) ...	8

These experiments were repeated several times with the same results, and we conclude from them that—

1. By treatment with bichromate the sensitiveness of silver bromide is diminished, both in the case of cooked and uncooked emulsion, though both, after a less or more time, work perfectly clear. We cannot refer the action of the bichromate to traces of the residual salt; but it must be assumed that the silver bromide itself undergoes some change, which is quite stable after the whole of the salt has been completely removed.

2. A highly sensitive emulsion obtained by boiling for half-an-hour is reduced, after treatment with bichromate, in sensitiveness to that of an uncooked emulsion.

3. An emulsion which fogs very strongly, in consequence of

---

[*] *Photographic Journal.*

[†] Photographic News for 4th February, 1881, p. 53.

[‡] "Emulsion by Daylight," Photographic News for 11th of February, 1881, p. 61.

being boiled three times as long as is necessary to produce a highly sensitive emulsion, is doubtless improved by treatment with bichromate, although the fog is not quite destroyed. As regards sensitiveness, it is not in this case greater than that of an emulsion cooked only for a short time, and then treated before any fog makes its appearance. On the contrary, an emulsion boiled continuously until it fogs, and then treated with bichromate, is much less sensitive than that last mentioned, and even—at least, in our experiments—less sensitive than one not submitted at all to heating.

◆

PORTABLE STEREOSCOPE AND PANORAMIC SLIDE

BY WILLIAM HARDER WARNER.*

Those who make use of the old form of instrument will recognise in mine a material alteration as to its shape, it being both portable and convenient for carrying about when travelling, at the same time keeping all that is of value—lenses and slides—free from dust and injury.

It has often occurred to me that the applications to which this instrument may be applied are more than that of merely making pretty views of scenery, delightful though they be; but it may be utilised for a higher and more useful purpose, viz., the rendering of objects, such as castings, sections, and portions of machinery, locomotives, marine engines, &c., &c., so as to convey to workmen and others in large workshops an idea of the contemplated design, the relation one part has to another, and of the whole complete, on either side. Again: how it may be made to subserve most useful purposes by architects and builders, and by its aid, in conjunction with drawn plans, the ideas of massiveness, proportion, and size, as well as of design or elevation, may be conveyed to those employed, thus enabling them to realise in some measure what the finished work would be. Still greater value would be imparted to these stereoscopic productions if they were taken "to scale"—a point which I am working out just now with every prospect of success. Indeed, this might, in time, form a *specialite* of itself, being both useful and lucrative to those adopting it, and the proofs thus obtained, if printed in platinotype, being permanent, would thus form a valuable record of the work.

The negatives for this stereoscope are made on plates 8½ by 6½ inches, to cut a clear 5¼ by 3 inch picture, the mount being 7⅛ by 6 inches. Long-focussed lenses are used of ordinary and wide angle, according to subject. In architectural interiors those of short focal length are often a necessity; but less than five and a quarter or six inches should not be used, otherwise both the breadth and boldness of the conception are lost.

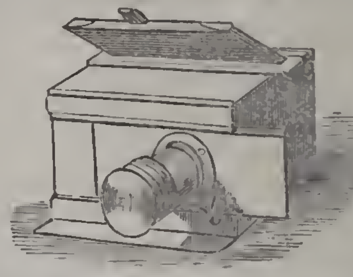
In the composition of the subject care is necessary to ensure relative size and proportion, both in the foreground and middle distance.

In order to obtain the proper adjustment of the instrument readily, having placed a picture in position, first separate the eye-pieces horizontally as far as they will extend; then, looking through the lenses, with both thumbs gradually draw them together until you can see but one picture; now raise or lower them until comfortably adjusted, and then you can thoroughly enjoy the slides. The best position for seeing them in the evening is with the light in front. The metal division is but seldom used, but some sights require it.

One slide—the North transept, Tintern Abbey—illustrates what has been taken by some American gentlemen to be the spirits of departed monks made visible. To that end some dozens were sent by me fourteen years ago to the United States to the order of an eminent spiritualist. Looking attentively on the ground, midway between the door of the sacristy and the steps leading up to the triforium, may be seen three shadowy forms supposed by him to represent the robes of three monks. The discovery of these shadows on the negative at the time took me by surprise, although afterwards, in working with a smaller pair of the same class of lenses, and under the same conditions, I obtained similar results. This set me thinking as to how it was caused, because there was nothing visible to the eye or on the ground glass of the camera; yet that it had been recorded was a fact. After a few experiments I discovered that such pictures could only be taken with a strong but direct light facing the camera, or in sunshine after rain with certain lenses. I attributed the particular effect in question to the reflection of the mullions of the window at the top of the gable of the transept upon a volume of air loaded with moisture at the upper part of the south transept window directly opposite the foreground.

Such was my impression in 1867. In 1874, however, when taking the interior of a church in North Wales, in which was a large east window of white glass, a similar occurrence took place on two separate occasions (the church being a very damp one). I got two east windows—one in its proper place, and the other considerably to the left and in the immediate foreground of the plate. It was plainly attributable to a series of flare peculiar to the kind of lens used, caused by the reflection of rays from one of the surfaces of the back on to the posterior surface of the front lens, which, in turn, reflects it on to the ground glass or sensitive plate.

There is one point suggested to my mind which will be of interest to all, and to amateurs generally, because it will give them an opportunity of making slides without the extra expense of purchasing pairs of lenses, unless it be intended to make instantaneous pictures. In the diagram is shown a simple expedient by which one lens is made to answer for taking two pictures. On the camera front is fitted two guides, so as to allow of a horizontal motion being given to the sliding front piece upon which the lens is screwed. By adopting this, all the lenses you possess become useful in taking stereoscopic pictures, and in these days of dry plates there need be no fear of stains from the little extra time taken up in working the second picture.



In conclusion: I would fain hope that the introduction of this stereoscope, after lying dormant for so many years, may again become popular among the higher and educated classes. The rapidity by which pictures may now be taken by gelatine plates offers facilities for obtaining pictures of moving objects both by sea and land, which heretofore has been deemed to be impossible

◆

ART AND PHOTOGRAPHY: SUGGESTIONS FOR BRINGING THEM INTO CLOSER CONNECTION.

BY HERBERT B. BERKELEY.*

For my part, I think it would be a pity were the valuable discussion on the important subject of art in photography, inaugurated at the last meeting of this Society, to be abandoned altogether in favour of those purely scientific questions, the dissemination and discussion of which this Society has at all times especially fostered, but which, after all, are mainly valuable as a means to an end—the better securing of more perfect pictures.

Of course I am now leaving out of the question the many applications of photography to science, and for these reasons,—that not only are we confining our attention at present to art-photography, but also because the members generally are interested in the making of transcripts purely terrestrial; though all are glad to hear how the goddess they worship is able, as it were, to soar into the heavens, and to bring us evidence of the fervid and varying heat of far-distant suns, and to show how many of them would be capable of yielding, in ages to come, probably, endless supplies of the very chemicals in which we all take so absorbing an interest! But those who deprecate our almost exclusive attention to and interest in one branch of photography, to the neglect of the other, which may seem equally deserving of notice, may bear in mind that there are very good reasons why the scientific should have precedence of the artistic aspect of photography. In the first place, science can vastly aid art—indeed is its foundation in a material sense, while art cannot assist science. Further, science may be largely acquired by intellectual study, art is essentially inborn; and each true artist impresses his works with a something that he cannot communicate to others; each must by himself study nature, and therefrom for himself obtain inspiration.

---

* Condensation of a paper read before the Manchester Photographic Society.

* Read before the Photographic Society of Great Britain.

But I would not have it for one moment supposed that I hold that no benefit can accrue from papers and discussions upon art matters; my opening sentence testifies to the high esteem and and importance in which I would have them held. I must say that I approach this subject with much diffidence, feeling a consciousness that I am stepping in "where angels fear to tread"; at the same time, if I fail to hit the mark, or to rise to the level of my subject, perhaps my failure may serve to call forth discussion, and so aid in furthering the cause we all of us would wish to promote.

First of all:—What is art-photography? Is it not the result of the camera, which, not violating art-rules, is also possessed of poetic feeling? To this I would add that, as some of the most renowned painters have occasionally violated the canons of art, yet have achieved a triumph, (though mainly due to the masterly use of colour, probably), no very hard-and-fast rules can be laid down as to what shall, and what shall not, be considered within the pale of true art. Every rule has its exception; and art is not exempt from the general law. Therefore, like most other definitions, the one I have proposed is not altogether satisfactory. But that which is admired by true and acknowledged artists is art; the feeling of artists changes, to some extent, with the age in which they live.

If I am not quite prepared to say, with Mr. Payne Jennings, that a large number of the works exhibited at our yearly exhibitions, should never find a place on these walls, still I go with him to this length,—that a dozen or two pictures in each exhibition, might at least well be dispensed with, and yet the show would not suffer in general effect by the weeding operation. Indeed, it often happens that pictures of some merit are "skied" in order to find room for some very small, and in every way, insignificant works. Let me not be misunderstood; better, I say, a small, insignificant work than a large insignificant work; for the former takes up less space, and, in a sense, makes its own apology. But, to me, it seems that merit of moderate dimensions often has to go to the top of the wall, while inferior works of small size occupy space which might otherwise be given to the other more deserving works.

I further think that the time will certainly come when our Hanging Committee will be called upon to exercise their discretion upon the acceptation of exhibits: otherwise, we can hardly aid in proving to the world that photography is capable of producing art in monochrome; or, at least, should the public admit that here and there, now and again, instances may be adduced proving that in talented hands photography may aspire to art, yet these instances, being comparatively few and far between, will generally be lost sight of in the chaos of inferior—far inferior works. Photography's fair fame will be sullied; but as for photographers as a body, in the estimation of the art-world they will be, to use Mr. Warnerke's expressive term, "nowhere!" In judging of the status of an art or of a people, I take it, the *average* talent is estimated; so in the case of an art-exhibition.

We do not wish to be reminded that there are still bunglers in the ranks of photographers in the present year of grace, just as there were in the good old days, thirty years ago. We know this to our cost; and we know also, that every year brings fresh hands and minds into our ranks; but the latter worthy strivers may be content to wait; and as to the former class, we want no reminders that they are influencing the present status of photography. They are ever present with us. Still, I feel that the change advocated should be a gradual one, and not a sweeping reform; and this may probably be Mr. Jenning's opinion too. The tendency to selection, instead of discouraging intending exhibitors, would urge them to strive for better results; there would be a feeling of satisfaction in having passed a certain standard—a somewhat low one, may be, but still an encouragement to persevere.

But some may ask, who are to form the art-censors for the purpose in question? Well, here we certainly have one of the principal difficulties in the way, especially as many competent critics probably would decline to accept the position. This is one of the reasons why I would advocate no sweeping reform. Many specimens of "our art" do not require an art-critic to emphatically close the door to them; let these be excluded; but all in time.

As photography is a science as well as an art, and as one of its strongest points is the exact delineation of many of the works and delicate operations of Nature, this important application of it must not be overlooked when arranging for the productions having their aim in art. Such specimens must be judged, of course, from a purely technical point of view; and as there are generally but a few of them contributed, and as they are out of character with the rest of the exhibits, it would be well to hang them apart, say on the screens, where they can be minutely examined.

Mr Jennings has already pointed out the importance and necessity for giving careful study to each subject. There is, especially with dry-plate workers—those of old, but particularly those of the present day—a strong tendency towards a striving to expose a large number, even a dozen or more, of plates in the course of a day spent with the camera. With some, the non-ability to do so leads to much disappointment; while, when the contrary is the case, great is the rejoicing and satisfaction at the complete success of the day's operations. The plates are rapid, and so is every movement of the operator; indeed, his time is mostly occupied in moving. Dry plates, too, are now no longer the result of patience, care, and some anxiety on the part of the user; and consequently "easy come, easy go" is the natural sequence.

The camera is treated, even by those who really know better, too much as though it were capable of producing pictures; whereas it simply produces, in an imperfect way, the image of the object presented to it. This may appear a perfect picture at first sight, indeed, may be really so; but how often the balance of light and shade, due to colour, is lost in the transcript of the camera! In several ways, more study has been required; and the same hurry and uniform treatment are observed in the development, and in all subsequent operations; until the result is left neglected, to fade away from the memory of the operator and from the paper on which it is printed.

It is useless to compare photography with colour painting, owing to the fact that we have not yet arrived at colour-photography. It will be better to confine our comparisons to the arts which are more akin to our own—monochrome painting, original etching, and engraving; here we are upon more equal ground. I may here incidentally remark, that nothing is said to so severely test the skill of an artist as monochrome painting; hence it will be seen that photographers have in this fact yet another stumbling-block to the attainment of the honours of art. With engravings, or reproductions of works of art, we may well compete, and compare our results thereto; for the art of the painter, not Nature's forms pure and simple, may then be reproduced. What position does photography here take? Not a very high one, I am afraid, in most cases; still here, if anywhere, our art should have the opportunity of showing its strength. There are many who will say that its strength lies in its weakntss—it fidelity to truth; only to form, however. But if this be so, than pure photography cannot aspire to take rank with the fine arts; for no artist would paint as the camera does, even though he were able.

In photography there is a pre-Raffelitism which is only too painfully evident; everything in certain planes is sharply defined: nothing is left out. Art of this kind has never obtained the lasting sanction of the art-world.

Mr. Cocking, in pointing out the marked difference between the handiwork of the draughtsman and the productions of the camera, aptly remarks that, while the former uses "marks or signs" to represent the subject before him, the lens of the camera reproduces the exact form of the object, and that herein we find a wide gulf which must always distinctly divide one from the other. Mr. Cocking considers that Art in photography is attainable; but that it is a distinct form of art, and will remain so. It certainly is the great bane of photography that nothing can be left out—all is reproduced as in a mirror; and not only is it impossible to get rid of unsightly objects, except by avoiding the subject altogether, but we also nearly always obtain too much detail, or otherwise, in the absence of it, a hard patchiness. We cannot secure the general effect and feeling which the artistic eye so keenly relishes, and which the painter reproduces by means of his "marks or signs;" and so the result of the camera rather bewilders the eye, as, in searching out the main point, it loses itself in the mazes of detail.

Something may certainly be done to correct the map-like effect by putting the obnoxious detail "out of focus;" but, then, it often happens that in doing so another part in the same or contiguous plane accompanies its neighbour into obscurity, and so what is gained on the one hand is lost on the other.

It is the capacity for judging which should form the salient points, and for determining the happy mean, that, quite as much as that for selecting the subject, goes to form the success of our foremost photographers. In judicious selection we conform to the grammar of art; but it is in the treatment of the various planes of perspective that we attain to its poetry.

Do we not often have hundreds of minute shining leaves all "sparkle" (we may have too much of a good thing) where we would have foliage little more than suggested? I think for the purpose of picture-making—and it is this purely that we are now considering—it should be considered legitimate to modify such effects, either upon the print or upon the negative. Much may be done by broad effects worked upon the back of the negative, the result, in skilful hands, being more true to nature as well as more artistic.

(*To be continued.*)

HINTS ON APPARATUS FOR DRY PLATE WORKING.

BY A. A. CAMPBELL SWINTON.

Now that gelatine dry plates are so firmly established, and now that nearly all—amateurs, at any rate—have given up wet collodion for ever, a corresponding revolution will be looked for in the mechanical part of photography. With wet plates it was a physical impossibility for one man to carry all his apparatus alone, and so when an assistant or a van was a necessity, it did not so much matter whether the apparatus weighed a few pounds more or less. But "nous avons changé tout cela," and the dry plate man goes alone into the field, with his camera on his back, and his tripod in his hand. And as this is the case, cameras for dry plate work are made as light as possible.

A very light and serviceable camera for cabinet pictures is the "scenograph," manufactured by the Sciopticon Company. It consists of two mahogany frames, united by a conical bag of black material. Two mahogany distenders give it rigidity when required for use. The dark slides have cardboard shutters which draw out completely. The stand folds into very small compass, and is of the Kennett type, while the lens, a simple landscape one, gives clear and sharp pictures. In fact, for the amateur who does not aspire to large pictures, the scenograph is all that can be wanted. For larger pictures, however, the camera must have more stability, and then the new one made by Messrs. Rouch is everything that is required.

The best way of carrying a camera is in a bag of some water-proof material on the back, but it may also be carried in the hand. The dark slides should be always, if possible, kept out of the light, as however well made they may be, light sufficient to impress a dry plate nearly always manages to get in at some place or other, if the slide be placed in a bright light. I know that some people despise such articles as cardboard slides, and call them gimcrack; but all I know is that they answer their purpose, and that is everything.

Correspondence.

SCIENTIFIC AND SATIRICAL WRITERS.

Sir,—It interests me, a comparative outsider, to occasionally note some of the characteristics of the various photographic writers whose productions adorn the journals from time to time.

We have, in the *Quasi*-scientific writer, one who delights to flourish before the face of the dazzled and delighted reader a series of no less than three initial letters, these being intended to signify that our friend is deeply versed in science generally, but more especially in chemistry. The initiated, however, merely gather two facts therefrom. First, that he subscribes two guineas annually to a learned corporation; and, secondly, that he wishes to be regarded as being deeply versed in all the learning of the Egyptians. The latter is, however, a difficult illusion to maintain; he must write frequently and voluminously, and it is not easy to do so without occasionally unmasking himself. We sometimes find this type of writer struggling with a lens much too large and open apertured for him; and after failure upon failure, he discovers that such an instrument actually requires a careful adjustment to focus. This novel and important fact forms the text of much bombastic writing, in which he altogether fails either to conceal his photographic inexperience, or his ignorance of elementary science. Having now, in his own opinion, established a reputation for optical learning, he proceeds to periodically enlighten the world as regards lenses and their uses, his writings being extremely entertaining to those who know a little of optics. Occasionally, however, our great man descends to humbler themes, and favours the photographic public with details as to how he, the learned, skilful, and renowned, performs ordinary operations. He tells us how porcelain is rapidly penetrated and corroded by silver nitrate solution; a novel fact, certainly, as porcelain is regarded by most as one of the most impervious bodies ordinarily met with, contrasting strikingly with the common and porous earthenware of which many of the ordinary photographic dishes are made. Other practical information on a par with this is freely given to the world by writers of the class now alluded to, but time will not allow me to enlarge on this matter.

Another branch of photographic literature is in the Buffoonish or Clown like; and the writers who adopt this style generally prefer to write anonymously, so there is then no need for them, like the *Quasi*-scientific writer, to refer to an encyclopedia at every turn; for who can expect scientific or classical accuracy from a literary or photographic buffoon? Once upon a time some of my own work had the fortune to fall under the criticism of one of the most entertaining, but least accurate of these writers on comparing, however, his misapprehension of the case with the simultaneously expressed views of a Quasi-scientist, I discovered the most perfect accord. Therefore I merely smiled as I asked myself: Is it possible for the same imaginative writer to pose in two positions? F. Symon.

Wandsworth, April 29, 1881.

THE LATE EARL BEACONSFIELD.

The London Stereoscopic Company present their compliments to the Editor of the Photographic News, and beg to enclose him three portraits of the late Earl of Beaconsfield, of which they possess the copyright. They were taken in a studio in Regent Street, and were favourite pictures of the late Countess of Beaconsfield, and they are interesting at the present time as showing the late Earl in his prime.

CLEARING NEGATIVES.

Dear Sir,—Please make a correction in the article that appeared last week, headed "A New Clearing Solution for Gelatine Plates." On page 189 it says:—"With the solution I have mentioned, the negatives are, however, thoroughly developed. It ought to read:—"With the solution I have mentioned, the negatives are, however, *improved, if* thoroughly developed."—Faithfully yours, J. Cowell.

DEVELOPMENT OF DRY PLATES.

Dear Sir,—Many very interesting letters and communications have lately appeared in your columns on certain details of gelatine practice, which have a special interest at the commencement of a season. May I ask a brief space to review some of these utterances, and to summarize, in a practical form, the uses of some recent formulæ?

First, as to the now well-known Brighton formula of Mr. Cowell, for clearing the yellow colour from dry-plate negatives, for which the thanks of all are due. By the use of this, which consists simply of a pint of saturated alum with an ounce of either tartaric or citric acid, the slow printing quality of dry plates for the non-actinic colour is quite removed. No one should be without it, as a much larger number of proofs can be got off in a given time than by leaving the plate the ordinary colour. Now with regard to the use of alum alone: many have the idea that this is only intended for the prevention of frilling; but this is not so. I strongly recommend, at all events during warm weather, that, after development and thorough washing, negatives, previous to fixation, should be soaked two minutes in a fresh solution of alum. It dissolves soon, and should be renewed daily. The object is by no means confined to preventing frilling, for it consolidates the film, and gives it a leathery toughness, and power of resisting damp atmospheres, as well as a much better surface for the retoucher.

Now a word on developing. Mr. Edwards' glycerine developer is, beyond doubt, the best known, and besides the good results it gives in perfect clearness of shadows, it effects a serious economy of pyrogallic acid, as one portion of the developer can be used during a whole day.

In our establishment it is the practice to mix a quantity in the morning for use during the day. Contrary to what might be supposed, the plates developed when the mixture is perfectly black and opaque are better than those done with a new portion. It is well, however, to wet the plate first, as if its first contact whilst dry is with the black fluid, a stain results. Those who are using a large number of dry plates soon find an important saving of time and chemicals from not having to mix their developer each time. It will, of course, be understood that from time to time a few drops more of the concentrated pyrogallic and glycerine, and of the bromide and ammonia, must be added. By this system the plate is under a sufficient body of the fluid to exclude every ray of light, and this tends much to maintain the clearness of shadows. Care must be used to prevent air-bubbles, and any of the solid deposit settling on the plates. When not required for immediate use, the solution should be poured back into a glass. I look upon this method of developing as quite doing away with any occasion for ferrous oxalate, which it supersedes advantageously.

I see my friend Dr. Liesegang has advised the use of glycerine with ferrous oxalate, and it is heralded as a new discovery; but it has been in use here and published in a paper of instructions (enclosed) for some month past.

With the pyro-glycerine no difficulty is found in getting full printing intensity, which is acquired in a steady, gradual manner, rarely found by the earlier methods. This obviates the necessity of intensifying, except in rare cases, in which Mr. England's may be used. Let me caution your readers against the use of Holme's Ozone Bleach as a reducer of density. If they want to remove films and all off the plate, or clean off waste emulsion plates, it is perfect.—I am, &c., Samuel Fry.

[We give insertion to Mr. Fry's letter, although his remarks upon the properties of alum are scarcely novel. As to Dr. Liesegang's statement in last week's News that glycerine, as a restrainer, "appears to work more energetically than one-tenth the quantity of bromide," we certainly deemed it worth noting. We do not suppose that Dr. Liesegang would claim, any more than Mr. Fry, the "discovery" of adding glycerine to the oxalate developer.—Ed. P.N.]

◆

Proceedings of Societies.

Bolton Photographic Society.

The April meeting was held at the Bath, on the 7th ult., Mr. Parkinson in the chair.

It was unanimously resolved that the intended *soiree*, not having met with the expected support from members, be postponed until a more favourable opportunity.

Mr. Dalton (Hon. Sec.) exhibited a pocket camera, with a new swinging back arrangement, which was much admired.

Mr. Fry exhibited several views and transparencies obtained on plates of his own preparation.

Mr. Parkinson made a most successful enlargement on Morgan's paper by means of the Sciopticon lantern, from a negative of himself. The enlargement, when finished (15 by 12), was admirable.

A vote of thanks was passed to Mr. Parkinson for his demonstration.

A Council meeting was held on Wednesday, the 13th ult., Mr. Parkinson in the chair.

Votes of thanks were passed to the Platinotype Company and Woodbury Company, for their promises of assistance to the *soiree*, and to Mr. Perry for his indefatigable efforts for the musical portion of the programme.

The Secretary, with Mr. Cusson's valuable assistance, developed an enlargement on gelatine paper with alkaline pyrogallic.

The remainder of the evening was occupied with a lantern exhibition, Messrs. Harwood, Banks, and Taylor providing slides.

A second Council meeting was held on the 28th ult., to consider arrangements for the summer.

Liverpool Amateur Photographic Association.

The monthly meeting took place on Thursday, the 28th ult.,—Mr. W. H. Kirkby, President, in the chair. The usual preliminaries having taken place, Mr. W. S. Holden was elected a member of the Association.

The meeting then proceeded to discuss the rules drawn up by the Council to regulate the competitions for the coming season.

Mr. J. H. Day proposed, and Mr. J. L. Corkhill seconded, that a prize should be awarded to the best picture in each series, and that another prize should be given at the close of the season to the competitor who had produced the largest number of prize pictures.

The Rev. G. J. Banner thought that the value of the prizes should not be specified in the rules, but that they should be rather of an honorary character.

The Rev. H. J. Palmer recommended the use of certificates of honourable mention as prizes for the best picture in each series, and proposed, as an additional rule, that a third prize be offered by the Society annually for the best picture, which, as regards emulsion making, exposure, development, and printing, shall have been entirely the work of the competitor. This proposal was carried.

The Rev. G. J. Banner objected to the rule providing that competition subjects should be sent in a sealed covering bearing the private mark of the competitor, and moved that it be expunged.

Mr. J. H. T. Ellerbeck seconded this proposal, and the meeting agreed to it.

Mr. Bruce proposed, and Mr. Beer seconded, a rule that the judges of the competition should be wholly unconnected with the Association.

On putting this to the vote, eight were against and seven for the proposal, and it was accordingly lost.

The President then put the following rules to the meeting for acceptance, and they were finally adopted:—

1. That each picture for competition be sent in not later than 6.30 p.m. on the day of the meeting of the Association in November, addressed to the Secretary, Liverpool Amateur Photographic Association, Free Public Library, Liverpool.
2. That seven subjects for the annual competition be chosen at the November meeting.
3. That each picture be mounted, and may be either framed or not.
4. That the prize picture be decided upon by the vote of the members present at the November meeting.
5. That a certificate of honourable mention be given annually to the producer of the best picture illustrative of one of the chosen subjects.
6. That a prize (the value of which shall be fixed by the Council) be given annually to the producer of the best series of competitive pictures.
7. That the competing pictures must have been taken during the year preceding the adjudgment of the prize, and that the development and printing must have been the *bonâ-fide* work of the competitor.
8. That a separate prize (the value of which shall be fixed by the Council) be given annually to the producer of the best picture, on any subject, on films prepared with emulsion made by the competitor.
9. That all exhibits become the property of the Association.

The Chairman then announced that the meeting had selected the following subjects for competition during 1881 :—1. "Still Life." 2. "Foliage." 3. "Tired." 4. "Seascape." 5. "Interior." 6. "Cloud Study." 7. "Spring."

Mr. Roberts exhibited a simple instantaneous exposer consisting of a piece of blackened card with a horizontal slit as an aperture, which might be drawn over the lens by the action of the hand simply, or enclosed in a casing of card, as in that of the Rev. H. J. Palmer.

Some excellent negatives shown by Mr. Roberts proved how completely efficient this simple shutter was.

Mr. Corkhill then read an amusing and useful paper, entitled "Photographers Afield," descriptive of an Easter excursion by members of the Association to Llanwebllyn, Dolgelly, and Barmouth, and giving some account of the means employed in changing plates, &c.

Dr. G. A. Kenyon then gave a demonstration of the platinotype process, printing and developing with the greatest success some negatives of Welsh scenery. The various details of the process were watched with the closest interest and attention by the members present, and the results produced by Dr Kenyon were exceedingly satisfactory in every respect.

The Rev. H. J. Palmer then introduced the subject of halation of gelatine films, and remarked that the subject was still one of considerable mystery, and seemed to depend quite as much upon the chemical composition of the film as upon its density and physical character. He exhibited two negatives of interiors of precisely similar density and appearance of film before development, which had been exposed at the same time of day upon similar subjects. One of these plates had been backed to prevent blurring, and the other not so. The backed picture, however, showed halation to a marked extent, while the plate which had been unprotected by backing had been entirely free from the evil.

Mr. W. H. Wilson mentioned, as an excellent test for the presence after washing of hyposulphite of silver in a gelatine film, the application of the tip of the tongue. The presence of the slightest trace of hyposulphite was at once made known by the sweet taste, and the tongue could even be employed to remove the remaining hyposulphite.

Mr. W. Keith—an honourary member of the Association—exhibited some views taken by him of the Liverpool Waterworks at Vyrnwy.

Negatives and prints taken during the Easter excursion were exhibited by the Rev. H. J. Palmer, the Rev. G. J. Banner, Messrs. Day, Ellerbeck, Boothroyd, and Corkhill.

After cordial votes of thanks to Mr. Corkhill for his paper, and to Dr. Kenyon for his demonstration, the meeting adjourned to the last Thursday in May.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, May 10th, at the Gallery, 5a, Pall Mall East, when Mr. L. Warnerke will read a paper on his "New Important Discovery," and the adjourned discussion upon Mr. H. B. Berkeley's paper, "Art and Photography," will be resumed.

The Photographic Club.—At the meeting last Wednesday it was announced that on the following week the club would return to its old quarters at Ashley's Hotel. Mr. Cowan exhibited an ingenious arrangement for automatically placing recently coated plates in racks. *Out-door Meeting.*—The meet to-morrow afternoon will be at Chislehurst ; rendezvous, 6 p.m., the New Church. Trains from Charing Cross (via Cannon Street and London Bridge)—at noon, 1.40, 2.15, and 3.15, p.m. Return, 7.14, 7.31, and 8.23 p.m.

Messrs. Russell and Sons, of Tufnell Park, N.W., photographers to the Royal Family, are engaged in taking portraits of the members of the House of Commons. On Tuesday last they were honoured with sittings from the Earl of Shaftesbury, and were successful in taking several excellent portraits, which will shortly be published.

Wedding Cards.—Mr. E. A. Maxwell, of Barnet, sends us a novel description of wedding cards ; it is a combination print including photographs of the bride and bridegroom, with names and date of marriage, surrounded by a fancy border.

To Correspondents.

*** A cheque for two guineas will be given for the best practical essay "The Way to Preserve Negatives and Register Them." The following rules must be noted :—The article should be from one to two columns in length ; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st June, marked outside, "The Way to Preserve Negatives and Register Them." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected MS. In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final.* The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

Erratum.—Mr. H. B. Berkeley desires us to state that to the late M. Sammann, of Paris, is due the credit of introducing the hydrosulphite developer.

F. W. Barber.—Much depends on the construction of the stove ; but, under any circumstances, we should advise you to make some provision for leading the products of combustion into the open air.

W. E. B.—1. You will find by far the greater part of the information you require in Captain Abney's "Instructions in Photography," published at our office ; but for detailed information regarding special points, you will often have occasion to refer to original papers or articles. 2. As regards enlarging you will find all the information you require on pages 57 and 58 of the last issue of the Year-Book. You may take it that the Year-Books contain a tolerably detailed account of all progress in photography, both as regards methods and apparatus. 3. We have used thin glue with the greatest success ; and if care be taken to select a sample which is free from acidity or putrescence, one source of fading is insured against.

An Amateur.—1. Read the sentence again, and you will find that the substance is to be added directly to the emulsion. When thymol is made use of, it should be dissolved in a quantity of alcohol equal to one-twentieth the volume of the emulsion. 2. It is difficult to give an opinion without seeing the negative referred to ; but we are inclined to think that parts of the film must have been damp.

Novice.—You must first thoroughly remove the varnish by means of repeated applications of warm alcohol, and then treat with a solution of persulphate of iron, as recommended by Mr. Warnerke. See page 168 of the present volume of the News

Know Nothing.—The finest opal pictures are obtained by the carbon process. Sensitize your tissue in a rather strong bath, say 5 or 5½ per cent., as violent contrasts should be avoided. When thoroughly dry, any parts which require softening may be operated on with an ink eraser. No varnish is required, and water colours may be used for tinting.

An Amateur (No 2).—The excellent results you refer to depend rather on the skill of the artist than on the process. In the matter of colouring photographs, no method has yet been discovered which will enable an unskilled person to produce artistic results.

J. B. R.—The diaphragm or stop consists of an opaque screen provided with a circular hole, this screen being placed between the glasses in front, or at the back of the lens. The smaller the hole in the diaphragm, so much longer must the exposure be, and so much greater is the depth of definition.

Amateur (Bradford).—Water, 10 ounces ; acetate of soda, 100 grains ; chloride of gold solution (1 to 60), 1 dram.

Samuel J. Burrows.—The amount of gold you mention ought to tone two dozen cartes, unless you go in for very advanced tones indeed. Any trace of gold remaining over in the bath tends to deposit as a purple powder.

G. Carle —Another article by the writer you refer to will appear shortly.

C. J. Emery—W. H. Prestwich. Received.

W. J. Baverstock.—The leather to hand ; it answers very well, and seems to be quite free from traces of grease.

H. T. R.—The origin of the idea must be obvious to everyone concerned.

Desperation.—Throw away all your chemicals, thoroughly clean all bottles and vessels—excepting your earthenware bath, which you had better smash—and begin afresh.

F. L. S.—1. The process you refer to was introduced about six years ago ; but it never found favour with the general body of photographers. 2. Yes ; but if organic matter, such as albumen, is present, the case is somewhat altered.

Perplexed.—The markings are due to the presence of a trace of moisture in the tissue. The softened film comes into optical contact with the negative in places ; and at these points more light is transmitted.

A Reader.—Your application ought to be made through a member ; but if you were to enquire for the Secretary, and explain matters, no doubt all could be arranged satisfactorily.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1184.—*May* 13, 1881.

CONTENTS

	PAGE
Mr. Warnerke's New Discovery	217
Comparison of Pyrogallic and Ferrous Oxalate Developers	217
Photography In and Out of the Studio	218
The Artistic Element of Photography. By J. Hutchison Simpson	219
Condensers and Front Lenses for the Optical Lantern. By George Smith	220
Notes	221
French Correspondence. By Leon Vidal	222
A Gossip with Old Friends. By G. Croughton	223
Art and Photography: Suggestions for Bringing them into Closer Connection. By Herbert B. Berkeley	224
Correspondence	225
Proceedings of Societies	226
Talk in the Studio	228
To Correspondents	22

MR. WARNERKE'S NEW DISCOVERY.

There cannot be a doubt as to the vast importance of Mr. Warnerke's new discovery. The members of the Photographic Society, who on Tuesday evening listened to the simple words of Mr. Warnerke, and followed the demonstrations made before them, with unbroken interest, testified again and again their appreciation of his ingenious research, and if we only briefly refer to it on the present occasion it is simply because we are loth to dwell upon the subject before the paper in its entirety is published.

But we have no hesitation in placing some of the principal points before our readers, more especially as the former have ceased to be a secret to a privileged few for a week or more. Mr. Warnerke's discovery at once calls to mind Mungo Ponton's famous observation relative to the tendency of a mixture of gelatine and bichromate of potash to become insoluble on exposure to light. In every way is the phenomenon he has observed analogous to the action of bichromated gelatine, and if the reader will bear this fact in mind, we shall be able to describe Mr. Warnerke's discovery in a very few words.

Mr. Warnerke prepares a gelatino-bromide film, not in the form of a plate, but in the form of a flexible tissue. This tissue may be impressed in the camera, or printed under a negative—it does not matter which—and the image is developed by the ordinary pyrogallic developer. Gelatine tissue presents this great advantage over gelatine emulsion upon glass; no matter how long you expose it to light, there is never any fear of producing a reversed or solarized image, so long as you only temper the development. This is point number one, but it is a matter of insignificance compared to the rest of Mr. Warnerke's discovery.

When you have developed your image by means of pyrogallic and ammonia in the ordinary way upon the tissue, you have, to all intents and purposes, a gelatine negative similar to that produced upon a plate in the usual way. You need not, however, fix, and, indeed, the employment of hyposulphite or cyanide is altogether unnecessary. You take the tissue negative and proceed exactly as if it were carbon tissue; that is to say, you wash it, or develop it a second time in warm water; for Mr. Warnerke has found that gelatine containing any haloid salt of silver, exposed to light, and treated with pyrogallic acid, acts in precisely the same way as gelatine containing bichromate and exposed to light. The pyrogallic acid exerts a tanning action upon such portions of the film as have been impressed, and the consequence is that when warm water is subsequently applied, this washes away all the superfluous galatine, and leaves only that which forms the image.

Mr. Warnerke demonstrated the fact before the Society. He took a piece of silver emulsion tissue, which had been printed like carbon tissue behind a negative, for a period of a few seconds only. This emulsion tissue, having first had its image developed in pyrogallic acid, was put to soak in cold water, just as if it was a carbon print. After the gelatine tissue had soaked in the cold water for a minute or two, it was placed face downwards on a glass plate (collodionized) and squegeed. Subsequently the tissue—precisely as if it were carbon tissue—was put into warm water, and the latter dissolved away all the soluble gelatine—or, rather, gelatine emulsion. The result was, that in the end nothing remained upon the glass plate but the silver image enclosed in insoluble gelatine.

We need not dwell upon the variety of treatment to which such an image may be subjected. It permits of intensification, whether by means of ordinary intensifying solutions, or by the aid of permanganate, as in the case of carbon prints, or by the use of dyes. The groundwork of soluble gelatine having been removed, the process of intensifying is much simplified; staining throughout the whole film is impossible, for there is no film left to stain. Again, as in carbon printing, the image may be reversed and subjected to double transfer. In a word, Mr. Warnerke shows that by impregnating gelatine with silver emulsion, the same results may be secured as with gelatine impregnated with bichromate.

Strange to say, oxalate development will not answer; it is the tanning action of the pyrogallic acid that makes the gelatine insoluble after being acted upon by light. The gelatine emulsion tissue may be loaded with fusible pigments, and in this way pictures can be produced capable of being burnt-in upon enamel or porcelain; or the emulsion film, again, may be employed for producing moulds suitable for the Woodburytype process. For collotype printing, Mr. Warnerke also believes these gelatine impressions will be found useful. It is too early yet, however, to do more than speculate upon the numerous applications to which Mr. Warnerke's new discovery is likely to lend itself.

◆

COMPARISON OF PYROGALLIC AND FERROUS OXALATE DEVELOPERS.

So much has now been written concerning the preparation of gelatino-bromide dry plates, that but little difficulty should be experienced in the manufacture of plates possessing any required degree of sensitiveness. Comparatively little, however, has been done in the way of establishing the superiority of any special mode of development; but each one, for special reasons of his own, appears to adhere firmly to that method which, in his hands, has produced the most satisfactory results.

It is probable, however, that there is a wide difference in the conditions necessary to the production of a good negative by each form of development; and this may be one reason why each one so firmly believes in the superiority of the formula which best adapts itself to his mode of manipulation. But given two negatives exposed under precisely the same conditions, and developed, one by alkaline pyrogallol, and the other by ferrous oxalate, it by no means follows that, by a slight alteration of the conditions, the developer which seems to give the worst result should not produce a negative infinitely superior to the other. For instance, we have exposed a plate, cut it into two parts, and developed the pieces by each method separately, when, while the ferrous oxalate gave an image beautifully bright, full of detail and density, the alkaline pyrogallol gave a thin negative showing all the signs of over-exposure. Another plate was exposed for about half the time of the former one, and also cut into two portions and similarly treated. This time the pyrogallol gave a far superior result. The natural inference from these observations is, that in order to procure results with the alkaline pyrogallol at all comparable with those produced by ferrous oxalate, the exposures must be different, and that an over-exposed negative developed by the latter method will not be so wanting in density, or so liable to fog, as would be the case if the former developer were employed. It was found also that one particular batch of plates, which were so prone to fog that it was almost impossible to obtain a good result when developed with pyrogallol, invariably gave clean, brilliant negatives when developed with ferrous oxalate.

Here, then, an important fact seems to be forced upon our notice, rendering it advisable to test carefully each batch of plates with each kind of developer, seeing that apparently some plates are more amenable to one kind of developer than another; and it would be of the utmost advantage to determine which will produce the best results in each particular case. It is also seen that in cases of over-exposed negatives, or of plates showing a tendency to fog, there will probably be a more satisfactory result produced by using ferrous oxalate than by using alkaline pyrogallol; but if the developer be prepared by Eder's formula, it is better not to trust altogether to the restraining power of the potassium sulphate formed by double decomposition, but to add a few drops of soluble bromide in each case. Thus we see that in order to secure a true comparison of the results to be obtained by different developers, the conditions, instead of being carefully made as exactly similar as possible, should be so regulated that each developer may be used to the greatest possible advantage; and that just as it must not be supposed that the reduction of the silver salt proceeds in exactly the same way whatever reducing agent may be employed, so it must not be assumed that sensitiveness with one form of developer is exactly the same as with another.

Having now alluded to the difference in the conditions necessary to success with ferrous oxalate or with alkaline pyrogallol, it remains to be seen how the physical structure of the metallic deposit differs in each case, and which is the more advantageous. Perhaps few things are more difficult than a correct comparison of the size of the grain produced by ferrous oxalate and by pyrogallol, since it is probable that this size varies slightly according to rapidity of development. A comparison, however, of a large number of negatives developed by both methods, and under various conditions, seems to prove that the grain is slightly finer when ferrous oxalate is used than that produced by pyrogallol; and the difference becomes more perceptible the greater the magnifying power employed. But this is not the only difference to be noticed: there is also, apparently, a great difference in the colour of the deposits. Even when apparently perfectly clear and free from any trace of yellow stain, negatives developed by pyrogallol appear beneath the microscope and by transmitted light to be far browner than those produced by ferrous oxalate. In the latter case each particle of silver appears of a fine, rich black tone; while in the former case there is a distinct brownish tinge in the case of all the negatives which have been submitted to examination. If these observations are proved by further examination to be universally true, we have here the evidence of a distinct difference in the physical character of the deposit, and it remains to be proved whether the best printing results will ensue from the finer and blacker deposit of the ferrous oxalate developer, or from the slightly coarser and browner particles produced by pyrogallol.

Other points, which it would be of much interest to note, would be the difference in gradation of tone and in clearness of shadows. In the case of gelatine negatives the microscope clearly shows that the clearness of the shadows is only a comparative term. The most transparent spots, and those which give the blackest tones in the positive print, are marked by a considerable amount of silver deposit, and it would be interesting to know whether this deposit is less with some kinds of developer than with others. So far as our examination has gone, we have failed to distinguish much difference in this respect; but if there is any difference at all, it appears to be to the advantage of ferrous oxalate, which, apparently, is capable of giving the clearest shadows.

A most striking point in the case of each developer is the sharpness of the line which separates a high-light from a deep shadow, and the comparative insignificance of the lateral spread of the reducing action from the former into the latter; but that this lateral spread does occur to some extent is evident from the rapid, but yet almost insensible, gradation from the dense to the transparent deposit, somewhat resembling the penumbra bordering the shadow of an object projected upon an illuminated ground.

As regards the number of different tones present in negatives of each kind, it appears that when the negatives are good, there is not much difference in this respect.

It is to be hoped that photographers will not become wedded to any one method of development until it has been distinctly shown that superiority belongs to that method under all circumstances. It is probable that different cases will require different treatment, and that a use of either developer, as occasion may recommend, will lead to the production of better results, and fewer failures, than the continual adoption of one particular formula in all cases and under all conditions. Not until the processes of development have been as carefully criticised as the details of the preparation of the sensitive emulsion have by this time been, shall we be in a position to form any correct idea of the capabilities of the gelatino-bromide process.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Permanent Home for the Photographic Society—A New Actinic Substance—The Photophone.

A Permanent Home for the Photographic Society.—The suggestion made by Mr. H. Berkeley, as to the desirability of the Photographic Society having a "freehold" in which to hold its meetings, instead of being a tenant at will, no doubt, is one that may be approved in the abstract. As to its practicability, that, in the present state of the Society's finances, is altogether out of the question. We may, therefore, safely leave the matter in the hands of the members, as it is pretty certain a permanent home is very far away in future. One of the reasons urged by Mr. Berkely is, however, deserving of a little more attention. He seems to think that if the Society had a room of its own the annual exhibition could be held at a more convenient time of year than is at present the case. Now we are inclined to believe that on this point opinions will differ. No doubt, so far as the public are concerned, it is very much more pleasant and convenient to visit an exhibition in May and June than in October and November; but would an exhibition in May and June be more convenient to the photographer?

We fancy not. It must be remembered that during the winter months photography is almost at a standstill, and certainly no photographer would dream of preparing pictures for exhibition at this time. But, during the summer, the landscape photographer, who, as a rule, supplies three-fourths of the pictures in every exhibition, is busily at work, and it is only towards the end of the summer that he is able from his stock of negatives to make his selection of the best, and satisfy himself as to the quality of his prints—not always an easy matter. The portrait photographer is in pretty much the same situation. Despite the sensitiveness of gelatine plates, the forced development, necessary even with these in the dull light of winter, never produces the result of the short exposure and quick development of the spring and summer, and under the most favourable circumstances he could not hope to produce "exhibition work" until July and August—certainly the two worst months in the year, as the public then are thinking of the seaside rather than of London exhibitions. The matter is of course worth discussion, but we do not see that the Society or photographers would benefit if the present date of the exhibition were altered.

A New Actinic Substance.—The development by the late Mr. Balmain of Canton's "phosphorus" from a laboratory experiment into an article of practical utility has naturally directed attention to the actinic qualities of compounds of sulphur other than the sulphide of calcium. Dr. Phipson has recently made some experiments by which he gets what might almost be termed a reverse action; that is to say, the absorption of light, as in the case of chloride of silver, produces a change of colour from light to dark. The experiment consists of the production of a zinc white of a dazzling purity, obtained by precipitating a solution of zinc sulphate by means of barium sulphide, submitting the precipitate to strong pressure, and, heating it with limited excess of air. If any barium sulphide escapes oxidation; the white compound, on exposure to the sun, begins to darken, and in about twenty minutes becomes of a deep slate colour. If removed into a dark place it gradually loses colour, and in about five or six hours it becomes again snow-white. This experiment may be repeated with the same specimen as often as desired. Further, this change of colour does not take place under a slip of common glass, whether thick or thin; at most, the compound takes a slight yellowish brown colour on exposure to the sun for two hours. It was suggested as an explanation of the phenomenon that the compound might have contained silver; but this on analysis was found not to be the case, nor was there present any other substance known as actinic. *Apropos* of Balmain's paint, we might mention that we were shown a few days ago, by Messrs. Ihlee and Horne, the elegant adaptation of the luminous substance to photography, of which mention has recently been made in these columns. The method consisted in backing a transparency with the paint, exposing to light, and exhibiting in the dark. The effect of the violet light shining through the transparent parts of the picture was extremely beautiful, and every detail was clearly visible. As a novelty, illuminated stereoscopic tranparencies, shown, of course, in the old form of closed stereoscopes, would probably command a ready sale.

The Photophone.—From a lecture delivered by Mr. Shelford Bidwell, at the Royal Institution, on "Selenium and its Application to the Photophone and Tele-photography," it would seem as if the theory lately advanced that the changes in the selenium plates were due to heat rather than light, had received further confirmation. In the experiments made by Captain Sale, he came to the conclusion, on moving a piece of selenium through the solar spectrum, that the maximum effect was produced at or just outside the extreme end of the red, or a point nearly coinciding with the maximum of the heat rays. Professor Adams performed the same experiment with the spectrum, both of the sun and of the electric light, and found that the action on the selenium was greatest "in the greenish-yellow and in the red portions of the spectrum." The violet and ultra-violet rays produced very little (if any) effect. "In consequence," says Mr. Bidwell, "of the discrepancies in these results, I determined to repeat the experiment for myself. The source of light which I used, in the first instance, was an oxy-hydrogen lime-light, and the spectrum was formed with a bisulphide of carbon prism. The experiment was repeated six times, and three different selenium cells were used. The results were precisely the same in every case, and proved in the most marked manner that the greatest influence occurred in the boundary-line between the red and the orange. Moreover, the resistance when the selenium cells were placed in the ultra-red, two inches beyond the limits of the spectrum, was in every case lower than when it was in the blue, indigo, and violet.

THE ARTISTIC ELEMENT IN PHOTOGRAPHY.

BY J. HUTCHISON SIMPSON.*

THE rapid strides which photography has made within the last few years is only equalled by the many and diverse purposes to which it has been applied. Perhaps no art of so entirely novel and complex a character ever had such a speedy development, for within the short period of one generation it has reached, if not perfection, at least a good honest manhood. Certainly its advent was in an auspicious period. Itself a child of science, it was born at a time when the best and keenest intellects of the civilised world were being directed to that focus when the laws of the physical universe were being investigated and generalised into a system or code which has had everything to do with the development of arts and industries.

Photography has shared in the benefit arising from the steady advancement of science. As an art it has been aided by almost every contingency that has arisen out of the inventive activity of our time, for it trenches more or less on a large portion of the materials employed in our commercial industries. In fact, it is an art that draws its life and its breath from the sciences.

Now, it is just because of this overbearing relationship to science, the constant and perplexing attention that needs to be devoted to matters of chemistry, of optics, of meteorology, &c., that I have thought it might not be amiss to bring back the attention to matters calling for the artistic element. It has occurred to me that, both in the proceedings of our own Society, and in the pages of the journals, there is a great preponderance of attention paid to matters which may be considered by many as more practical and valuable than this of which I speak, but that, nevertheless, the artistic element in practical photography is so important as to be well worthy of a great deal more interest being paid to it than at present publicly appears. Such papers as we have had from Mr. Neilson, Mr. Mackay, and others, dealing directly with the practical application of the principles of art to photography, have been few and far between; and yet it is quite possible that the treatment of such a branch of the photographer's art might be both as interesting and as valuable as any of the very practical matters that are brought before us from time to time.

For its full and perfect development or evolution, it demands on the part of those who practise it many special gifts and acquirements, qualities of both brain and hand that are not vouchsafed to all. In fact, the more one sees the amount of latent power that is every day being eliminated from the camera and the dark room, the more one is inclined to the conclusion that, with the application of the very finest skill, and the best balanced mental powers, the artistic products of photography may come to rival the very finest products of either ancient or modern times.

This truth was put in a nutshell the other day by one of those Yankee journalists who contribute so liberally to our amusement and knowledge, serving it up with the most savoury sauce. "Most any man can buy a fiddle, and some cameras don't cost much, but it is fair to say that few men call out a thousandth part of the capabilities of either instrument. There is as much playing 'by the ear' on cameras as on fiddles." Now that, I think, without derogating at all from the anxiety and earnestness that may be applied by even the best photographers, only states the bare fact of infinite capabilities that yet lie latent in the camera's power. But beyond that, it suggests what has hitherto been a hindrance and a reproach, namely, that men were using the camera who might possibly have mechanical aptitude for some of the minor operations of the studio, but who were not in the remotest degree artistic in any sense of the word, whose work was consequently inartistic, crude, and discreditable to the camera as an artistic instrument, giving only too good ground for the oft-repeated, but none the more true assertion, that photography is not art, but merely a mechanical process, involving the application of a certain amount of manipulative dexterity, along with the use of more or less complex chemical formularies, often supplied by other brains than that of the operator. Nothing more.

---

* Read before the Edinburgh Photographic Society.

Now, I beg to submit that he who uses the camera aright, bringing along with him a sufficient scientific knowledge, a subtle handicraft, and, above all, a truly cultivated and refined artistic spirit, may be as much of an artist, and produce as good a work of art, as any of the masters who have handled the brush, the chisel, or the pen.

For what is the difference either in the means or the ends, apart from the character and quality of brain that plans, conceives, directs, and circumvents the whole object, which we call a work of art? Does it matter whether the artist uses a lump of dull clay, a series of coloured earths softened with oil, or a solution of gun-cotton and silver as the medium by which he wishes to express his feeling or his conceptions of external objects? They are but the instruments which he uses to build up the representation of his ideals. In so far as he shows cleverness and dexterity in the handling of his medium and his tools, we praise him for his "technique."

But one who is only clever in "texture and handling," yet shows no sign of the great underlying noumena, or artistic spirit, is at once condemned as no artist in the true sense. A painting, a statue, or a photograph may show great perfection in the handling of tools, beautiful texture, and fine finish, and yet neither the one nor the other indicate the slightest presence of æsthetic beauty, or a high and lofty conception of the inner charm and loveliness of even the meanest things of earth. It is not the medium that makes the art, but the mind that uses it. It was not the gold and precious stones that adorned the Athene, in the Necropolis of Athens, that constituted it a work of art, but the abiding presence of beauty in which the sculptor had enshrined it. The marble and the jewels were but the medium by which he expressed his artistic conceptions.

But then, it is said, this art cannot reach the truest and grandest pinnacle, namely, the imaginative, or creative; it can only, at best, select or transcribe.

It would be a very interesting inquiry as to what are the laws and what the limits of imaginative art; how far, for instance, the painter can go beyond the forms that actually exist in the physical world, change he their relationship howsoever he will. Let him try to depict an Angel, an Ariel, or a Caliban, he is yet reduced to the necessity of adopting, amalgamating, and transforming forms that have at one time or another presented themselves to his senses. But it is unnecessary to enter on any such theme. We shall have to grant that the photographer must abide by that which exists—he must stick to *terra firma*, to things tangible and seen. But what then? Is there not sufficient substance—not enough of the very elements of beauty and of poetry in the mundane things of earth—upon which the artistic spirit can lay hold and garner up for us in a picture? However much man's highest enjoyments may be derived from the exercise of the imaginative faculties, it must ever remain true that artistic genius can always reach the cords of widest human sympathy by touching with its wand the common things of life.

In landscape work, where there is so much room for eclecticism on the part of both painter and photographer, is it not evident that (granting the disparity of attractions through absence of colour in the latter's work) there is as much room for the display of true nature feeling—that intense love and appreciation of the most lovely and enchanting aspects of nature—in the one process as in the other?

If the photographer is really artistic in his profession, will he not plant his tripod with as much care and nicety of choice, so as to obtain the very best point of view for a harmonious combination of the objects which he is about to "take," as his *confrere* the painter will his easel? Do Vernon Heath, Payne Jennings, and such men, not exhibit as much true art-feeling as any disciple of the brush? And more, does not the completed picture, with its delicate, unmatchable tones, down to the most infinite degree of refinement, and absolute accuracy, far outbanishing the most perverse pre-Raphaelitism, stand in honourable rivalry with the finest work of the painter?

The same remark applies to portraiture. It is a matter of bringing to the work in hand artistic knowledge, feeling, and refinement. Without that photography is an autonomy, not an art. I think it will be readily admitted by all who are acquainted with the progress of photography, that great advancement has been made during the last few years in what may be called artistic portraiture. The work of the higher class of professional photographers is marked by a decided art feeling, as well as art knowledge, which was not so widely characteristic a generation ago. One cannot help being struck by the improvement that is visible, not only in the show-cases where the best specimens may be expected to turn up, but also in the family albums, where we used to wade through so much of what might be called "pages of horrors." I don't say that has utterly died away yet, but there has been immense improvement.. But chiefly and conspicuously has the change taken place in the public portraits of public men.

So great has been the study and care in this branch, that good readers of character—students of physiognomy, say—might be able to tell the temper and peculiarities of some of our distinguished men from their photographs alone. Take, for example, that excellent series of Carlyle. Is it too much to say that in that portrait by Baker and Fry, in which the late venerable sage is shown with his head leaning on his hand, in an aspect of deep, calm abstraction, the photographer had made his subject a real study, and that the result is a true work of art? The gaze, or other "motiveised" expression, is rendered with so much grace and picturesqueness.

Now, it is this picturesqueness that is so much of a desideratum among a large number of photographic portraits still, and which, it appears to me, forms a very fitting part of the work of this Society to encourage and develop.

With the view of adding my mite to this work, perhaps I may be pardoned if I give expression to one or two ideas which have occurred to me as being both practicable and useful.

1st. The Society might organise classes for instruction in art as applied in photography. Some well experienced photographer who knew his busines in all its branches on its scientific side, and had a thorough knowledge and sympathy with art, might be induced to take pupils under training at a given sum per head. Such a liberal extension of the operation of the Society would only be on the lines followed, for instance, by the Philosophical Institution in organising French, German, and other classes for the use of its members.

2nd. In the absence of such classes, every facility and encouragement should be given to young men who have passed through the School of Design, and even the Life School of the Royal Scottish Academy, to enter the photographic profession.

3rd. One at least of the popular evenings of the Society might be devoted entirely to a species of instruction in artistic posing, with examples from best works extant, relating to that subject.

Would it not be possible to have such useful nights spent in experimenting together, as the photographers of Dundee have had lately under the direction of the indefatigable Mr. Cox, when trials of lighting, posing, effects in drapery and backgrounds arrangements of groups, &c,. &c,, might be gone into with mutual zest and frankness by all present—the kind of thing called tableaux, that used to be fashionable in the early part of the century, as described by Wilkie, in which a scene in history or romance was arranged so as to look like a picture? Such practice, carried on with mutual good-will, and with the single aim of being instructive to all concerned, would, I consider, form a valuable novelty in the transactions of the Society, while being the means of imparting some very interesting and invaluable insight into some of the principles that go to make up the art element in photography.

CONDENSERS AND FRONT LENSES FOR THE OPTICAL LANTERN.

BY GEORGE SMITH.*

The question of the condenser is one particularly well suited for discussion by a photographic society, on account of the many points of analogy between the optical lantern and the enlarging camera.

---

* Read before the South London Photographic Society.

The object in both cases is to obtain a well-defined enlargement from a small transparency, and therefore, if there are any special optical conditions applicable to the one, they would necessarily be adapted to the other.

It is not sufficiently well known to photographers that there is one point of vital importance as regards the production of the best results in enlarging, viz., that the copying lens should have a fixed position with regard to the condensing lens. That position is, that the stop of the copying lens should be at the apex of the cone of light issuing from the condenser, and that, therefore, accordingly as a smaller or larger negative has to be copied, so a front lens of shorter or longer focus must be employed.

This principle I have adopted in the improved form of the sciopticon which was first shown at the meeting of the South London Society in November, 1878, and which might be briefly described as focussing with the slide. The front lens is first adjusted so that the whole of the light from the condenser passes through it on to the screen; the stage, carrying the slide, is made to travel in front of the condenser, until the picture is focussed on the screen, and thus, by employing a front lens of proper focal length, there is not only a gain in definition, but of fully 40 per cent. in light.

Passing to the question of condensers, the size is governed by the transparency to be enlarged. In the enlarging camera they vary much, while in the optical lantern the size of the transparencies is almost always three inches—circular or cushion shape. I may point out that a clear four inch condenser will illuminate the current sized lantern slides. It must, however, be distinctly borne in mind that the special function of the condenser is to throw the light into the front lens, so that a distinct relation of focus must exist between the two.

Theoretically, if a source of light is placed in the principal focus of a condenser, parallel rays will issue from it, which gradually converge as the source of light is withdrawn from the focus. In practice, however, particularly with the short focus condensers which are necessarily employed for the optical lantern, no approach to parallel rays can be obtained, but a more or less confused series of cones of light issue from the condenser.

Notes.

It is astonishing what may be done with the latent image, if you only try, as witness the singular experiment Dr. Eder described in our columns last week. He exposed a film of chloride of silver to light, so that it became impressed with an image. But he did not develop the image at once; he put the plate for some hours in a solution of bromide of potassium, and this had the effect of changing the substance of the film from chloride into bromide of silver. But although the whole film was converted from one compound into another, the latent image was not interfered with; there it was still ready to be developed, only that a different developer was now necessary; for though you can play fast and loose with the latent image, it does not permit the liberty to go too far.

We have selected the essay of Mrs. Elizabeth H. Way, on "How I Keep My Books."

We are glad to see that Baron Pollock, the son of a former President of the Photographic Society, would not admit a photograph of two persons taken together, as evidence that they were engaged. Mr. Kisch, arguing in a case of breach of promise on Tuesday, averred it "was usual with engaged persons." Quoth the Judge: "That is a strange proposition, that when two persons are photographed together they must be engaged." Photographers might display a copy of this dictum in their studios to set the minds of sitters at rest.

Speaking of the phenomenon of halation upon a bromide negative on Tuesday night, Mr. Warnerke explained the formation of the transparent halo on the margin of a dense image, by the simple fact that bromine being liberated on exposure to light, this bromine combines with the water of the developer, and forms hydrobromic acid, and it is this hydrobromic acid which eats away the thinner deposit upon the plate.

M. Adam-Salomon's later photographic work—we alluded in our "At Home" to the portrait of a violinist taken at the moment of *attaque*, which was his last attempt at posing—was undertaken in conjunction with M. Koziell, the leading spirit of a photographic establishment in the Champs Elysées, near the "Rond Point," which has recently taken a prominent position in Paris.

Here is Dr. Eder's plan of treating fogged gelatine plates, to render them once more serviceable. A filtered solution is prepared of—

Ferricyanide of potassium ...	10 parts
Bromide of potassium or of ammonium	10 ,,
Water	100 ,,

The foggy gelatine plates are immersed for from ten to fifteen minutes. They are then rinsed, and put into water (changed at frequent intervals) for two or three hours, to wash them thoroughly. The ferricyanide solution will keep well if stored in stoppered bottles away from daylight.

Travellers tell strange stories; but not so strange as before the days of photography. The camera is, on the whole, a very impartial witness, and its corroboration goes far towards conviction. Mr. Whymper, who has just come back from ascending the highest peaks in the Andes—Chimborazo and Cotopaxi—brought home with him a most interesting series of pictures taken among these giant peaks, and when we heard him lecture on Monday before the Geographical Society, it was in these photographs that the interest centred.

Mr. Whymper's plates were, of course, gelatine, and they have now been enlarged very successfully by the Autotype Company. One negative, representing a steep snow slope which the intrepid Englishman climbed, was taken 18,400 feet above the sea, the highest point upon which a camera has been placed. Mr. Whymper makes out the peaks to be considerably lower than was stated by former travellers, "a fact to be accounted for," he said, "either by exaggeration, or by supposing that the Andes had been sinking ever since they were last measured."

The Paris *Figaro* maintains that it is in the hands of West End photographers to decree who shall be a "professional beauty." It is not the photographer who kneels to beauty, it seems, but beauty who invokes the photographer to constitute her "a joy for ever." What happy men some of the photographers at the West End must be!

Laine claire, a Paris photographer told us the other day, he preferred his lady-sitters to wear.

Two advertisements from the *Archiv*:—"A photographer of forty summers desires marriage immediately with a young lady photographer conversant with painting and retouching."

"A photographer, recently established, will give employment to a young lady who may be disposed hereafter to marry him." We may inform our lady readers that answers to the above should be addressed to the office of the *Photographisches Archiv* in Berlin.

FRENCH CORRESPONDENCE.

Hydrotypie and Direct Polychromie—Conclusion of the Lectures on Photography at the National School of Decorative Art—Congress of the Learned Societies at the Sorbonne—Exhibition of Photo-Paintings by Madame Dubreuil.

Hydrotypie and Direct Polychromie.—M. Charles Cros, who is well known to be the rival of M. Ducos du Hauron in the exploitation of photographic printing in three colours, has lately taken out a patent for a process of hydrotypie (as he calls it), to which he has appended a process of direct polychromie. This latter process is, in my opinion, still only in a state of theory, more or less capable of being put into practice; but the theory itself has considerable value, and it is quite possible to suppose that it may be made practically useful. To proceed, however, in order, hydrotypie is not in reality a new process, for all who have practised collotype printing must have had more or less an idea of it. The principle on which it rests is as follows:—A layer of gelatine, either free, or on a support, is exposed to the action of light under either a negative or a positive image, and, after this has been immersed in water to remove any free bichromate, and then dried, it is plunged into some aqueous colouring solution. The gelatine swells up in those places which have not been acted on by light, and absorbs in those places alone the colouring liquid. As a result, we have a coloured image formed, positive from a positive plate, and negative from a negative one. Hence M. Cros deduces, in the first place, a method of printing mono-chromatic pictures in water-colour; this is hydrotypie, properly so-called. It is only necessary for the gelatine to absorb the colouring medium, and then to press a paper over the surface. Impressions taken from the chromograph with aniline violet may serve to give an idea of this method of printing. In the second place, he has conceived the method of producing, by absorption, direct coloured images in the gelatine itself, so as to form transparencies. The colouring solutions which M. Cros has at present experimented with, are, for red—ammoniacal carmine, fuschine, and eosine; for yellow—barberry root, picric acid, and soluble picrates; for blue—Prussian blue, aniline blue, and indigo. In can readily be imagined, without any further description, how far this method of impression can be made to render good service. As regards the direct polychromie, this is a much more complicated subject, and a process which, as I have already said, is still in a completely rudimentary condition. A knowledge of the principle, however, on which it is founded, is capable of affording much interest. It consists in the preparation of a plate formed of three layers, superposed one on the other—one being red, the second yellow, and the third blue. The light of any particular colour of the spectrum destroys the pigment of the complementary colour which exists in one of the layers: thus the orange rays destroy the blue pigment, the green rays attack more especially the red pigment, and the violet rays affect the yellow pigment, The three superposed layers are formed, the first of collodion coloured red by carthamine, the second of gelatine tinted blue, and, lastly, the third of collodion coloured yellow with turmeric. If to this triple layer there be applied a transparent glass plate—either green, violet, or orange—the following action will take place:—The green light will pass, without producing any appreciable effect upon the yellow layer of turmeric, or upon the blue layer; but when it arrives at the red layer of carthamine, it will be absorbed; it will set up oxidation of the carthamine, and decolourize this substance. A similar effect will be produced upon one of the tertiary layers, either by the violet rays or by the orange rays. Thus we can obtain a directly coloured positive copy of the transparent image applied to this threefold layer; but the impressions thus obtained have no pretension to durability. M. Cros has not yet succeeded in preventing it from disappearing altogether under the action of light; he has, however, attempted to arrive at this object, and he has even described in what direction his attempts have been applied. It will be seen that the question is far from being solved at present; it is, however, deserving of great attention, as pointing out how direct polychromatic images may be obtained. We shall all be glad to see endeavours of this kind crowned with complete success.

Conclusion of the Lectures on Photography at the National School of Decorative Art.—This subject recalls to my mind my last and closing lecture of the course delivered at the National School of Decorative Art. It was entirely devoted to the subject of colours, and I took the opportunity of pointing out how greatly the results of instantaneous photography differ from the actual impressions on the eye; it is for this reason that photography is often abused on account of its inaccuracy, when in reality the fault depends on its extreme accuracy, so that a fact which is noted by the eye appears under quite a different aspect by reason of the continuance of the impression on the retina. For example, the wheel of a carriage in movement, when photographed instantaneously, shows all the spokes distinctly separated one from the other. The eye, on the contrary, has only a confused conception of the spokes; and a painter who desires to render by means of the pencil and brush a revolving wheel, produces a picture in which no single spoke is visible. This example, which is only one of many others, shows that the photographic impression must not be confounded with that produced on the eye, and that in producing photographic copies of animated moving objects, we can obtain only the effect of perfect rest, and that the more complete in proportion as the exposure has been more rapid.

Congress of the Learned Societies at the Sorbonne.—The congress of the learned societies of the provinces took place during Easter week at the Sorbonne. It is with great interest that I attended the meetings of the sections of physics and of chemistry on the one hand, and of that of fine art on the other; but I regret to say that there was no communication made in either of these sections relating to the art of photography, except a couple of papers of my own, of which one was a description of the selenium photometer, and the other was a defence of photography considered as a means of producing works of art, properly so called. We have, unfortunately, in our midst, a school of Puritans as regards art, who refuse to take advantage of scientific invention as an aid in the production of works of art; they adhere pertinaciously to the ancient processes, which, as we must admit, have made the glory of many generations of artists. This, however, is no reason for remaining ever fixed to the same spot. The advancement of science, whether we will or will not, carries us forward all the same, and it is now a matter of necessity to take photography into account. The argument which I maintained in my paper, though I could only treat it superficially, is, that we have no cause to enquire what is

REMOVED FROM PATENT OFFICE LIBRARY APR 1953

the means employed in producing any work. If it is worthy of being called a work of art, what difference does it make whether it has been executed by steel, by fire, or by light? It is, or it is not, a work of art. But the school of which I have been speaking will not concede to a work produced by photography the title of a work of art, whatever may be the qualities which it possesses; it is only a photograph, and there is nothing of art belonging to it. It is curious to note to what length people will go in opposing this view of mine; still I cannot but believe that the greater number of intelligent men would rather be in favour of it than hostile to it.

Exhibition of Photo-Paintings by Madame Dubreuil.—From this subject to Madame Dubreuil's exhibition of copies of pictures in the Dresden Museum there is only a step. When I first entered this gallery I took these photographic reproductions for real copies in oil, so perfect was their execution: the *fac simile* is so complete that the eye is entirely deceived. In the process for obtaining these reproductions photography plays the chief part. A carbon print is taken upon a glass plate, coated, in the first place, with some isolating material, and, in the next place, with fatty or pasty colouring matter, which may be laid on from the back. A canvas is then applied and made to adhere to the picture, and the whole is then detached from the glass plate. The outline of this process is known to the whole world; but in the works of which we are now speaking, sundry artifices, of which I am ignorant, have been employed, and, thanks to them, the results obtained are really admirable. I should never have been able to discover that photography had been used, but that before I entered the gallery I had been told that the works were in reality photographic reproductions. This process is going to be adopted in France, and I hope it will obtain all the success that it deserves. In my opinion, it is one of the most remarkable applications of photography that has ever been made. No doubt this process is better adapted for copying old pictures than modern ones. My reason for supposing so is, that the greater number of pictures in the collection are of the former kind; but even if we are able to use it only for old pictures, the advantage obtained is very great. LEON VIDAL.

A GOSSIP WITH OLD FRIENDS.

BY G. CROUGHTON.*

IT is about seven years since I had the pleasure of meeting my old friends and fellow-members of the South London Photographic Society at one of the monthly meetings, and I am sorry I cannot personally read this paper, if paper it can be called.

Ill-health, which caused my removal from London, made me resign my membership, but I have kept myself posted up in your proceedings through the pages of the PHOTOGRAPHIC NEWS, and I think I am justified in congratulating you upon the success of your efforts. It was always a prominent object of the South London Society to promote art culture in connection with photography, and I am pleased to see that this feature has been developed in a most practical manner, and I hope the movement, being quite in the right direction, may be better supported. I refer to the competitions which Mr. Dunmore suggested, which are upon the same lines as the artists' sketching clubs. Would it not also be advisable to introduce their practice of exhibiting the sketches for the criticisms of the members?

A remark was made at your last meeting by Mr. Dunmore, and echoed by Mr. Cobb, that photography at the present date had no superior claims to art qualities than it had some fifteen years ago, or, in other words, no advance had been made artistically during that period. Mr. Fry, on the other side, argued that a great advance had been made during that time. My own experience and observation would make me agree with both sides. In portraiture there has been a most marked advance; the public have been educated, and demand better work—in fact, have become most fastidious; they are not satisfied with a clear sharp photograph, unless that is combined with artistic lighting and posing; and when a photograph taken twelve or fifteen years ago comes into my hands, I wonder how they used to accept such things. It is true also that M. Adam-Salomon exhibited portraits some fourteen years ago which, for artistic qualities, have not been surpassed up to the present date; nor are they likely to be, for I believe that in those portraits he had come to the length of the tether which binds all photographers—that is, he did all it was possible for photography to do, aided as it was by great art culture and experience. Argue the case as you will, there is a hard and fast line, beyond which photography cannot go, and that has been reached many years ago by such men as Reijlander, Robinson, Salomon, Hubbard, Distin, and many others. One improvement I have noticed in the composition pictures, or subjects pictures, and that is in simplicity. The artists do not attempt too much. A single subject carried out in a simple manner has proved far more satisfactory than a subject which has taxed the artist to the utmost to overcome manipulatory or other mechanical difficulties which did not add to the art qualities of the pictures. It was in the early days that Rejlander produced his "Two Ways of Life"—a most ambitious attempt, which plainly showed how far photography could go, and marked a line which in all his later work he never attempted to overstep. Again, contrast Mr. H. P. Robinson's "Bringing Home the May," and a "Holiday in the Woods," with the later pictures, where only one or two figures are introduced, and a simple tale is told in a simple manner; there are the same art-culture and taste, the work is guided by the same art rules, but the mechanical difficulties, being more under control, do not obtrude themselves, and the art qualities are more apparent. There is one reason, that I have never seen mentioned, why there are not more who go in for such pictures. Almost all the persons I know who have produced these pictures can paint, and it is really more trouble to them to produce a picture photographically than to paint it; and when the pictures have been produced, in what a different light are they regarded! A painting is a work of art, and its producers entitled to rank as artists, but how few value a photographic subject picture at its proper value! Critics think they have awarded such a picture high praise when they say it might be mistaken for a copy of a good painting. After having seen something of the trouble and patience expended by my friend Mr. Hubbard upon the production of his most artistic little picture, "Stolen Moments," and knowing that he would have painted the same subject in less time than it took him to get a satisfactory photograph of his model, the female figure alone, I have wondered why he did it, especially as I know its production was a pecuniary loss to him.

But leaving this, the higher branch of photographic art, I will return to portraiture. I quite agree with Mr. Fry, that of late there has been a great advance in the general run of portrait work, and I must say I have found in my own practice that I have been much more successful with expression (the soul of portraiture) since I have confined myself exclusively to the use of gelatine and bromide plates, and these I get as rapidly as I can. It is all very well to talk about the good old-fashioned slow exposure (there are some old fogies who still talk of the good old-fashioned stage coach), but the world is not likely to go back to stage coaches, for all their talk, nor photographers who have mastered the difficulties of dry plate development to go back to bath and collodion. I have banished both, and effected a fire assurance upon my premises at a considerable reduction, upon condition of not having a drop of collodion upon them. I have always been disappointed with nine-tenths of my photographic portraits on account of the expression. When talking to my sitters, the expression has almost invariably been much more pleasing than when the dreaded moment arrives when they are desired to be still. Now I do not ask them to be still; the conversation is kept up the whole time, and I catch them either while listening to what I am saying, or just after making some remark themselves. If the results were not quite so good photography, the greater success with expression would counterbalance it, for all must have been much annoyed, as I have been, to see a sitter choose from the proofs submitted the worst photographically, because there was something in the expression which was more like; but, speaking from a three years' experience with gelatino-bromide plates, I can say that the results are more certain and in every respect equal to the bath. For comfort of working, and rapidity with which you can get rid of your sitters, there can be no comparison. And then the babies—who would prefer the bath to dry plates for these? Why, I often wonder how I ever got a portrait of a baby before the era of dry plates. I shudder when I remember half a morning wasted, temper tried, and other sitters impatient, and the result anything but satisfactory; this must have happened with all. Now I do not dread the liveliest baby, and have not had a morning wasted since I have used dry plates. Of course there are difficulties, but they are to be overcome, and different operators will have their own methods of working. I cannot succeed so well with the ferrous oxalate development as with pyrogallic, and since I have used glycerine have effected a great saving. To one ounce of pyrogallic acid I put three ounces of methylated spirit and three ounces of glycerine; six minims of this contains one grain of pyrogallic acid, and I have had this mixed for nearly seven months without spoiling. The plates require thorough washing till all greasiness has disappeared before putting into the alum bath (which I never omit). If this precaution is neglected, they show a curious mottling, due to the unequal action of the alum.

---

* Read before the South London Photogrpahic Society.

Have any of the members tried Mr. Morgan's gelatino-bromide paper for enlarging. It is certainly one of the easiest methods of getting an enlargement I have tried, and the results are very fine—a rich black with every gradation. They form a splendid basis for printing in crayon, the colour matching admirably. There is only one drawback, that is, I cannot feel quite sure of their permanency. I think they stand a far better chance than the solar prints made upon iodized paper and developed with gallic acid, but I think there is always a lurking doubt where silver and hypo are used. I have one or two pictures exposed with a portion covered up to test them, but, of course, that will be a question of time. But I have adopted it instead of collodion transfers for painting upon with oil, for having been used to the orthodox three paintings, my pictures, when they are finished, are so overlaid with colours, that the photograph may fade if it likes without making any difference. I use it also for canvas pictures, making the enlargement upon gelatino-bromide paper the size required, chalking the back and tracing through upon the canvas, the picture being then used as a guide. It can be used also to make a transparency from which to make a negative for carbon printing. Make the picture the size you want, but carrying on the development longer than for a picture which is wanted to be seen upon the surface; when dry, it can be worked upon with black-lead pencil and crayon. Put it into a printing frame with plate glass front, and print upon ordinary albumenized paper very deep; fix in hypo without toning. The negative can either be waxed, or printed without; in the latter case a slight grain will show, of course. The negative can be printed from either side, so that it may be used for either single or double transfer.

This, I think, is a most useful application of this paper; it gives an artist the power to work up to any extent upon the paper transparency, which work will be reproduced line for line and touch for touch in the carbon prints, so that even if it is proved not to be permanent, it is still a great addition to our means for producing improved results.

I must not now take up more of your time. I hope the next time I write a paper for the South London Photographic Society I may be able to read it myself, and renew old friendships.

ART AND PHOTOGRAPHY: SUGGESTIONS FOR BRINGING THEM INTO CLOSER CONNECTION.

BY HERBERT B. BERKELEY.*

In landscape photography there is generally a want of unity and breadth; everywhere are crisp detail and evenness of lighting. When there is a shadow it is generally only where it cannot be otherwise—under the stump of a tree, under boughs, and so forth; there are no broad effects of tender light and shade; yet photography is hardly to blame here, but rather the users of it.

To some extent I agree with Mr. Blanchard as to large photographs being generally disappointing—a waste of space and energy; but I see no reason why we should not aspire to pictures of equal dimensions to those of the beautiful and costly engravings we cannot fail to admire and attempt to emulate. Engravings, etchings, and sepia and India-ink drawings are all purely monochromatic, yet they cause no great craving after colour; they produce no feeling of half-satisfaction. Why is this? Is it not simply because the effect of colour upon the eye is truly translated by the engraving into monochrome? The gradations and tones of the original are all there; and so is the balance of light and shade faithfully preserved.

We may, therefore, I think, continue to work in the direction of large pictures, by which, let it be understood, I mean not those of stupendous size, wonderful to behold, but pictures as large as the engraver produces. Beyond this point size is hardly desirable, especially in the present state of photography. At present, to say the least, we had better modestly confine our work within the limits of the conventional, and not bring down upon ourselves ridicule as well as adverse criticism.

It remains, then, for us to apply some method by which colour—especially that of paintings—can be truly translated. This, of course, is a subject for special study; and it would be impossible, even if I had the ability, to enter into the subject within the limits of this paper; but I believe our scientific photographers have discovered a means by which the end sought might be attained. We are made acquainted, by the labours of Captain Abney, with the fact that dyes, when applied to the sensitive film, may act in two distinct ways. In the first place, if the dye be capable of oxidation under the influence of light, it will be so acted upon by the rays absorbed by it. The product of oxidation causes the reduction of the silver salt upon development. The other action is purely physical, a sensitive film being rendered by suitable colouring matter more amenable proportionally to the rays it transmits than to those it absorbs; in other words, certain coloured rays are prevented from reaching the sensitive salt. The colouring matters suitable for this purpose are those on which light has no action. Now I incline to think that the latter class of dyes might be applied to bromide films, which might also be prepared in different states of colour sensitiveness. The dye might, perhaps, be dissolved in collodion and applied to the surface of the film. Thus, if we want to heighten the comparative sensitiveness of the film to the red rays—having, say, to copy a picture of a Cardinal, or Millais' "Beef-eater,"—we use a suitable body, transmitting mainly the rays which produce the colour, to the obstruction of the rays of more sober hue, but which ordinarily would photograph many shades lighter.

It is possible that sometimes flatness might be produced; but, as a rule, the fault to be found in reproductions of pictures is too violent contrast.

I am aware that this is no new idea, but believe that the present time is favourable for research in this direction, seeing that we are now using not only dry-plates, but films of exceeding sensitiveness, and that to the whole range of the spectrum.

Before I conclude, let me say a few words upon what I consider should be the aim and ultimate goal of this Society.

Names are often the result, more of caprice than of well-directed choice made with definite reason. This Society commenced its career as the "Photographic Society of London," and under this title it made its reputation and enrolled its members—members residing in all parts of the United Kingdom, and not in London only. The Society was recognised to be a suitable centre to which might be referred, and from which might fitly emanate, all those matters affecting the welfare of photography. This being so, it was only right, in justice to the provincial members, as well as in the interests of the Society as a body, that the Society should have changed its name, and taken that of the "Photographic Society of Great Britain."

Now there can be no doubt that this Society is the representative photographic assembly of Great Britain—certainly of England, though Scotland is rather sparsely represented, Ireland not being included in the title; and, therefore, it should be able to draw towards it more extended support.

Those who are interested in the progress of photography—and what man who takes any interest in its practice is not?—should feel it a pleasure and a duty to aid in giving to it, whether it be their occupation or their hobby, the status and full recognition which have been accorded to other and earlier arts and sciences. How have the various learned and artistic societies centred in this metropolis obtained the high standing and influence they now enjoy? In the first place, they have been incorporated by charter of the Sovereign, thus gaining the recognition of persons in high places; though it is only correct to say that they did not gain their privileges, as a rule, at once, or for the mere asking. In the second place, the societies proved themselves worthy of being considered the leading bodies taking an interest in matters appertaining to the advancement of the common object. Not only did the societies include the foremost workers and thinkers of the various arts and sciences, but they extended their influence into all parts of the country, until it became not only a pleasure and a duty to aid them in the general work of mutual advancement, but also a highly-coveted honour.

---

* Continued from page 214.

Now I do not propose to suggest that this Society at the present time should strive after incorporation; neither am I sufficiently sanguine to suppose that non-members will hasten to join our body for the sake of the honour reflected upon them. But this I will say, that I think the time has now come when this Society should endeavour to seek out means by which the general body of photographers throughout the United Kingdom might be drawn towards and look up to a true "Parent Society," of which this may fitly form the nucleus. "But," some may exclaim, "this has been our policy for years past, and so it still remains; we invite members to join, but our numbers do not greatly increase." Well, this is certainly so; and, therefore, it seems to me that it behoves us to inquire in what way we may render the membership of the Society more attractive.

I think, in the first place, it should be the recognised desire of the Society to possess a home of its own. I do not think a society can possess much influence, as an authoritative body, which cannot point to the visible emblem of its wide-reaching power. Besides, with a learned society a library and museum are almost absolute requisites, and, perhaps, so also are means for occasional technical demonstration and art-lectures.

The annual exhibition formed by this Society is no doubt valuable for the advancement of photography; but at how dismal a period of the year we are compelled to hold it! Then, too, new specimens of the art can hardly be got ready in time, especially those of amateurs; and when all has been prepared, and the doors open, nearly the whole of the usual frequenters of picture galleries are out of town.

For various reasons, therefore, it is evident that a home is what we require. Here the exhibition might be held, say in the month of April, before the rival colour-exhibitions open, and before the heat of summer becomes oppressive. I feel certain that the exhibition, if held at this time, would obtain far more support than it does at present, both from the public and from those who wish to obtain ideas for the work of the ensuing season; and for this reason alone the membership of the Society would be more esteemed.

Above all things, then, tending to the advancement of the interests of photography in this country and of this Society, I would place any movement which should ultimately procure for us a "local habitation and a name."

Correspondence.

A PLEA FOR WET PLATES.

Dear Sir,—I was pleased, the other day, on reading the News, to see that some of our leading men have made up their minds to return again to the silver bath during the summer months. Being an old worker of the wet process, now a quarter of a century, I must put a word in for our good and well-tried, faithful servant, the nitrate bath. Now, sir, I hope you don't for a moment think I am going to condemn the gelatino-bromide plates: not so. They have been a great boon to us during the dark winter days, and have many advantages; still, as far as my opinion is concerned, there is room for improvement in the wet process, and I feel convinced that directly the cap is off the lens, and the light is thrown on the plate, the impression is there. There remains but to be discovered a developer that will bring out the picture in all its detail. There is certainly a pleasure in working the wet process when you can pretty well depend on every plate, and in developing you need not be closed up in a closet dark as pitch, without ventilation, &c. I have frequently developed wet plates with my dark room door wide open, and with a strong flood of yellow light from my window, without the least signs of blur in the shadows. I do not mean to say I do so often, but what I maintain is, that there is no necessity for closing up every crevice, &c., as for dry plates. You cannot get that beautiful creamy bloom that you can produce by the wet method; and still photographers want to abandon that beautiful process. Doomed! doomed! doomed! you hear many say. I say, let some of our experimentalists set to work and discover a new developer that will enable us to take instantaneous pictures in the studio, equal in rapidity to gelatine plates.

There is one great *advantage* with wet plate working: if your negative does not please you, you can rub it off and coat a fresh plate, the cost being very trifling. I think the price of dry plates is ridiculously high. I opened the other day a parcel of half plates, and found four out of the dozen were broken, and the bits of glass had nearly destroyed the films of the others. As I pay a high price for carriage, this comes expensive.—I am, dear sir, yours,

Nitrate Bath.

REDUCING INTENSITY OF GELATINE NEGATIVES.

Dear Sir,—Having recently been so very successful in reducing the intensity of some of my gelatine negatives—many of which were actually put aside as useless—I would advise those who have not already tried Holmes' ozone bleach, to give it a trial. It is so inexpensive and simple, that one wonders it has not been more extensively used. One view taken many miles away from home, which was so dense that it could not be made use of but by the application of ozone bleach, in the manner recommended by Mr W. E. Debenham, I was enabled to make into a splendid printing negative.—I am, &c.,

T. J. Miller, Junr.

N B.—I beg to add that the plates which I subjected to the above treatment were Edwards', Wratten's, and the "Archer."

HOLMES' OZONE BLEACH.

Sir,—In a letter published in the News of last week, Mr. S. Fry warns photographers against using Holmes' ozone bleach for reducing the intensity of gelatine negatives, and suggests that the only thing it is fit for is to wash the film down the sink.

As I introduced the bleach to photographers for the purpose indicated, I trust you will allow me to say that I have found it of great service to me, and that photographers have written to express their thanks to me for having published it, and this makes it probable that there is some peculiarity in the plates upon which Mr. Fry has tried it, to produce such a different result.

Mr. Fry occupies a great part of his article in enforcing the necessity of an alum bath. Now there is no doubt that alum is very useful to plates that would frill without it, or that are troubled with a certain chemical fog; but if these defects are absent from the plates, there is neither necessity nor advantage in using it; and to be obliged to have recourse to it, as Mr. Fry recommends, before fixing, retards the time when the plate can be thoroughly examined, and its quality decided upon. Certainly a photographer may dismiss his sitters and develop afterwards, but the more careful ones will prefer to make sure that the exposure has been right, and that no movement has taken place, and the necessity for an alum bath involves an irritating delay.

This insistance upon the use of alum suggests that Mr. Fry's experiments with the bleach have been made with plates having a strong tendency to frill, and therefore that the gelatine is exceptionally tender. With the plates that I have prepared myself, and with Swan's and Nelson's, no doubt with many others also, the bleach may be used diluted, as I advised, with safety, and with great advantage if the negative happen to have been developed with too great intensity. It would perhaps have been as well if Mr. Fry had confined his warning to those who use plates of his manufacture.

After all, it is not well to be too much disheartened at Mr. S. Fry's denunciation of the bleach. When he has tried it on plates of a tougher kind he may perhaps be one of its most enthusiastic admirers. He is not above altering his opinion, as is shown by his recorded experiences in developing gelatine plates.

In April, 1879, Mr. S. Fry says, "No difficulties attend development." Then in the August following, when Mr. Henderson had introduced ferro-cyanide of potassium in the developer. he was so loud in its praise that he said, "It entirely changes the whole aspect of affairs." Scarcely desirable, one would think, if no difficulties had attended it before. Some little time later, Mr. Fry laid great stress upon the necessity of mixing the pyrogallic and ammonia little by little. Now he tells us it is best to mix all together. And glycerine appears to have displaced in his esteem ferro-cyanide of potassium. Perhaps we must be content not to wait for Mr. Fry's final decision before settling for ourselves what form of developer to employ.—I am, yours obediently,

W. E. Debenham.

DRYING BOXES ON FIRE.

Sir,—I believe I am the unfortunate individual referred to in the News a short time ago as having had his dark-room and studio burnt down through the catching fire of a wooden drying-box.

As an explanation of the exact manner in which, so far as I can tell, the accident took place may prevent a similar misfortune to others, I ask you to be so good as to insert these few lines.

It was not the heat from the Bunsen acting direct upon the wood which caused the fire. Ample protection had, as I thought, been provided to prevent this in lining the wood near the flame with sheet iron. The whole mischief lay in a rubber tube by which the Bunsen was connected to the gas main. I imagine that the Bunsen "struck back," became heated, and that the rubber tube melted off, the gas catching fire as it issued from the tube. Of course the tube continued to burn, and did so until a place was reached where the flame impinged upon the wood of the box, when, of course, it caught fire. In my next box I shall have permanent iron gas fittings.

Let me take this opportunity of advising any of my amateur friends who have not yet done so, to insure their studios or photographic apparatus, and to point out to them that a policy of insurance, either for a house, or for furniture, does not cover photographic apparatus. I had not done this myself, and consequently found I had no claim for compensation. I must admit, however, that the Insurance Company in which the furniture of the house was insured acted in a most handsome manner in making me an *ex gratia* payment which covered about half the damage. I think the Company deserves honourable mention for its generosity. It is the "London and Liverpool and Globe Insurance Co." Why, I wonder, the redundency of "ands"?—I am, sir, yours, &c.,

A Burnt-out Amateur.

◆

Proceedings of Societies

Photographic Society of Great Britain.

The usual meeting of this Society was held on Tuesday, at 5, Pall Mall East, J. **Glaisher**, Esq., F.R.S., in the chair.

Mr. F. Galton and Mr. Miller Thompson were elected members of the Society.

The **President** announced that the annual exhibition would be opened on the 8th October, and closed on the 13th or 14th; the last day for receiving pictures being the 30th September.

Mr. **Warnerke** then proceeded to give the details of a new discovery he had made respecting the action of pyrogallic acid on gelatino-bromide. This discovery consisted in the fact that a gelatine plate submitted to pyrogallic acid became insoluble in those parts acted upon by light, exactly in the same way as gelatine acted upon by chrome salts, the insolubility being in proportion to the amount of light and the thickness of the gelatine. This property Mr. Warnerke proposes to utilise in various ways. The drawback in the ordinary gelatine process being that, unless the exposure is very accurately timed, there is considerable danger of over-exposure, and intensification being very difficult, pictures by the gelatine process are often inferior to those by collodion. By the new process he was, however, able not only to intensify, but also to overcome the drawbacks arising from over-exposure. The latter be effected by using the emulsion on paper. He had found that no matter how much the paper was over-exposed, the picture, provided the developer was restrained sufficiently, was not injured, while in the case of the emulsion on glass there was not only halation of the image, but a reversal also. The transfer of the image from paper on to the glass is very easy. The paper is immersed in water, and placed in contact with a glass plate. The superfluous moisture being removed by a squegee, the paper may then be stripped off, leaving the gelatine on the glass. Hot water is then applied, which dissolves all the gelatine not acted on by light, and the image is left upon the glass in relief. Intensification Mr. Warnerke effected by mixing with the emulsion a non-actinic colouring matter, and which is not affected by silver. Aniline colours he had found answered the purpose, and in this way special emulsion for special purposes could be prepared. This method of preparation he thought would be especially suitable for magic lantern slides. Mr. Warnerke claimed that by his discovery relief could be obtained far more easily than by the ordinary bichromatised gelatine, and therefore it was especially suitable for the Woodburtype process. By mixing emery powder with the emulsion it was rendered fit for engraving purposes, and by a combination with vitrified colours the image could be burnt-in, and being so adapted for enamels. By using a suitable emulsion, however, so little gelatine could be employed as to obviate all difficulty in carbonizing. The process could also be adapted for collotype printing.

In the course of his remarks, Mr. **Warnerke** demonstrated the removal of a gelatine picture produced by his method from paper to glass, and showed that the mere immersion and washing in hot water fixed the picture by the dissolving of the gelatine unacted upon by light, which thus carried away the unchanged bromide of silver.

In conclusion, Mr. **Warnerke** stated that the sensitive paper could be used in the camera in lengths, wound on rollers, and exhibited a slide which he had made for the purpose.

Capt. **Abney**, after some remarks in reference to halation and reversal of the image, said that in the production of enamels by Mr. Warnerke's process there was some danger of the silver producing the well-known yellow colour which spoilt so many vitrified photographs. The discovery made by Mr. Warnerke was a most important one, and in regard to Woodburytype really opened up quite a new era.

Mr. **Bird** endorsed Capt. Abney's remarks as to the value of the process. To be able to produce gelatine negatives without fear of the yellow stain was a great boon, and the only point was whether photographers would take the trouble and risk in the necessary transfers. As to its adaptability to the Woodburytype, there could not be the slightest doubt. The great difficulty was to obtain the necessary relief, and he knew of a company which had recently gone to a great expense to fit up the necessary machinery, when Mr. Warnorke was able to give them what they wanted at a merely nominal cost.

Mr. **Jabez Hughes** reviewed the various points touched upon by Mr. Warnerke, and pointed out that the feature most to be kept in mind by photographers was the bearing which the process had upon the production of negatives.

Mr. S. **Davis** also referred to the importance of the discovery, and suggested that by the use of the emulsion on paper, a landscape might be photographed, in which the clouds and the foreground might be rendered with equal truth, instead, as was too often the case, of the sky being over-exposed.

After some observations from Mr. Payne Jennings, Mr. **Bolas** enquired whether Mr. Waruerke had tried adding bichromate of potash to his emulsion. The addition of bromide of silver in the case of carbon tissue appeared to increase its sensitiveness.

Mr. **Warnerke**, in the course of his reply, said he had not found the yellow colour spoken of by Capt. Abney in the enamels which he had made. It was possible to eliminate all the silver by the use of ferric salts. With regard to Mr. Davis's suggestion, he was afraid he must throw cold water upon it, but he did not think it could be realised unless he used a developer for the clouds different from that used for the foreground. He had not tried bichromate of potash as mentioned by Mr. Bolas.

The **President** remarked upon the extreme importance of Mr. Warnerke's discovery, after which a vote of thanks was passed.

The **President** reminded the members that the first technical meeting of the Society would take place on May 24th, and stated that at the next ordinary meeting a paper would be read by Mr. Francis Galton, on his method of composite portraiture.

The meeting was then adjourned, the discussion on Art Photography being postponed.

South London Photographic Society.

The monthly meeting of this Society was held on May 5th in the rooms of the Society of Arts, Adelphi, the Rev. F. F. **Statham** (President) in the chair.

The minutes of the preceding meeting having been read and confirmed, Messrs. H. J. Godbold and A. Youngman were duly elected members.

The **Chairman** then called the attention of the members to the kind invitation of Mr. A. L. Henderson to meet him at Ashley's Hotel, Covent Garden, on Thursday next, to see a demonstration of the emulsion process.

The **Secretary** then read a paper from Mr. G. Croughton, "A Gossip with Old Friends" (see page 223).

The **Chairman** said that if some of the country members and old members of the Society would send up communications the Society would not not be pushed, as it was sometimes, for papers.

Mr. F. **York** said citric acid preserved pyrogallic solution from oxidation as well as glycerine. Half a grain to the ounce would keep the solution colourless for a prolonged period.

Mr. **Henderson** corroborated, and said all scum would be avoided on the developer, and the pyrogallic would keep for months, by using sixteen grains of citric acid to the ounce of pyrogallic.

Mr. **Cowan** said by using 109 ounces of water, one dram of citric acid, and an ounce of pyrogallic, a solution was obtained which did not foul the developing cup.

The **President** said Mr Croughton evidently did not know that the pictures in the artistic competition were exhibited at the meetings, but the goodly array placed behind him would at once settle the point. He then announced the subject for June as "Reflections."

Mr. W. **Brooks** then showed a negative and print by collodion emulsion on paper, the emulsion, he stated, being much more rapid on paper than on glass.

In answer to Mr. **Henderson**, he said he could give no reason at present why it should be so.

The **Chairman** said that Mr. Smith would now continue the subject of last meeting. The subject of lantern lenses and condensers was one of great importance, and could not be too thoroughly investigated.

Mr. **Smith** (Sciopticon Company) then made some exhaustive remarks on the subject, stating, in course of them, that so long as a lens covered a C.D.V. it would answer for the lantern, provided the condenser and apparatus were suited. The object of the condenser was to collect the rays of light, and make them converge into the front lens. He (Mr. Smith) preferred the meniscus form of condenser, and there should be a fixed position for condenser, and a fixed point where the lens ought to be. He then showed a sciopticon and an improvement he had made in the reflector, so as to admit of seeing the flame without the intense glare affecting the eyes. This was done by a glass reflector covered with pure silver, the effect being that the flame could be attended to without in any way affecting the sight.

Mr **York** said that the circular form of slide was the best and correct form, as the weak parts of the condenser showed in the square. The object, he thought, of these trials was to show what was the best form of lens that would answer the two purposes for portraiture and the lantern, the lenses usually fitted to lanterns being of no use for portraiture, as only the visual focus was adjusted.

The **President** said the members, of course, looked really to the point for making enlargements, and, therefore, the question was as to the power of the lens for covering to the edges, and also representing straight lines; he remembered slides painted with curved lines, so as to correct the want of straightness

Mr. **Brooks** said at the last meeting the disc was really too small to allow of a proper trial, as the difference of the value of the lenses is not so perceptible on a small screen as when the disc is larger.

A lantern and some hand-painted slides, sent by Messrs. Wilkinson, of Sunderland, were then shown. There being nothing special in the lantern, and the slides not being produced by any photographic means, no discussion arose.

Mr. A. **Cowan** then showed a very ingenious piece of apparatus for racking gelatine plates when ready for placing in the drying cupboard; it consists of a long slab on which a number of plates could be placed while the emulsion was setting; at the end is a rack into which the plates may be pushed when the slab is full, this being effected by one simple movement of a lever, the plates being pushed along the slab, and the end one placed into the rack by the same movement. The lever being again lowered, the rack is raised ready to receive the next plate, and when another plate is placed on the slab the movement is again gone through, and so on till the rack is full. It can then be easily removed and conveyed to the drying cupboard.

A vote of thanks having been passed to Messrs. Croughton, Smith, Wilkinson, and Cowan, the meeting adjourned.

Edinburgh Photographic Society.

The seventh ordinary meeting of the season was held in 5, St. Andrew Square, on Wednesday, the 4th inst., Mr. **James Henderson** (Vice-president) in the chair.

The minutes of last meeting having been read, approved, and signed, the following gentlemen were unanimously elected ordinary members:—Messrs. W. Harding Warner, James Johnston, and H. R. Smith.

Mr. J. **Hutchison Simpson** next read a paper "On the Artistic Element in Photography" (see page 219). The paper was listened to with marked attention, and gave rise to a good deal of discussion.

Mr. **Neilson** thought that the paper read by Mr. Simpson was very excellent, and he also hoped that more papers on the same subject would be forthcoming. Art, he said, was a thing to be acquired. The two ways of acquiring it were—first, by being trained in the notions of others; and second, in those of your own Looking at all the great pictures, and getting all the instructions from them possible, is a good way to train one's faculties; but you must also go on your own book, and educate your own self. Go and look at the landscape, and find out all about posing, light, &c., and you will be training yourself well, and in a profitable manner. Let the young photographer also look at the old photographs taken some ten or twelve years ago, and compare them with those of the present day. He would then benefit by seeing the different failures and improvements.

Mr. **James Howie** said he had listened to Mr. Simpson's paper with great pleasure, and congratulated him (Mr. Simpson) in the name of the Society upon its excellence. He further remarked that there was an amount of truth in a photograph, which could not be found in a work by an artist; he considered that a photograph—a good specimen, of course—was undoubtedly a work of art.

Mr. G. G. **Mitchell** said that many of the hints and suggestions contained in Mr. Simpson's paper were not only useful, but quite practicable.

Mr. **Henderson** had observed that if a man took up photography, either as an amateur or a professional, it was always possible to tell by his work whether he was a true artist or not. A man might be a good artist, but it did not follow that he could be a good photographer, and *vice versa.* A photographer would show his feelings in a photograph in the same way as an artist will show his feelings in his work, whether it is in oil, water, or marble.

(The Secretary at this stage placed on the table Rejlander's large picture, "The Two Ways of Life.")

Mr. J. M. **Turnbull** explained that the picture had been taken separately in some eight or ten negatives, and then put together, forming a composition picture. He observed that it was a most wonderful work of art, perhaps the most wonderful photograph ever produced; it did great credit to Rejlander. He did not feel himself competent, he said, to criticise Mr. Simpson's paper, but it was an undoubted fact that the art element in photography was on the ascendent. He moved a vote of thanks to Mr. Simpson for his interesting paper.

Mr. **Matheson** thought that Mr. Simpson's plan for establishing classes would be sure to turn out a failure.

Messrs. **Rankin**, **Scott**, **Porteous**, and the **Secretary** took part in the discussion.

Mr. **Simpson**, in replying to the vote of thanks awarded him, stated that he had given a good deal of attention to the subject, and thought it one which had an important influence on the advancement of photography. This was his only excuse for bringing before the Society his humble contribution to its transactions.

A vote of thanks having been given to the chairman, the meeting adjourned.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE annual general meeting for the election of office-bearers was held in the Religious Institution Rooms on the 28th ult., Mr. JOHN URIE in the chair.

The minutes of the previous meeting were read and approved of, and the following gentlemen duly elected members:—Messrs. Robert Cunningham, James Lawson, and P. Davidson.

It was proposed by Mr. DODD, seconded by Mr. REID, and carried, "That the Council be instructed to ascertain on what terms the Philosophical Society would admit this Association as a section of their Society."

The meeting then proceeded to the election of office-bearers for the ensuing year; but as several gentlemen declined to accept the position of vice president, the matter was again considered on the 6th inst., the following being the final result:—

President—Mr. John Parker.
Vice-Presidents—Messrs. Ralston and Gilfillan.
Treasurer—Mr. George Bell.
Secretary—Mr. John Y. McLellan, 15, Armadale Street.
Auditors—Messrs. Parker and Tear.
Council—Messrs. Ramsay, Skinner, Urie, Moran, Robertson, and A. Bowman.

At the meeting on the 6th inst., a letter as to mounting pictures on glass was read from Mr. Warner, together with Mr. Parker's reports thereon (in our next), these being adopted as expressive of the views of the Association on this subject.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting was held in the Freemasons' Hall, on Tuesday, the 3rd inst., Councillor THOMAS FIRTH in the chair.

After the transaction of the usual business, a letter from Mr. Warner, of Bristol, asking for the opinion of the Society on certain questions submitted by him, was considered, and the following resolutions were unanimously adopted:—

To the question, "Are photographs mounted on glass admissible in an exhibition, when all the other competitors mount on boards?" it is answered, "Yes, in the absence of any conditions to the contrary in the conditions of the exhibition."

To the second question, "Are such pictures eligible for a medal at such exhibition?" the answer is, "Yes."

The third question was considered to be a matter between buyer and seller only, and was, therefore, not discussed.

It was also resolved that the next excursion be to Roche Abbey, on Wednesday, June 1st.

After the proposal of a new member, and some desultory conversation, the meeting adjourned.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Board of Management held their monthly meeting on the 4th inst., at 181, Aldersgate Street. The minutes of the previous meeting having been read and confirmed, Messrs. A. Lasauce, W. G. Smythe, F. H. Berry, S. Saunders, and G. E. Tayler were proposed, seconded, and duly elected ordinary members of the Association.

Mr. ASHMAN stated that Mr. A. L. Henderson desired him to inform the members of the Photographers' Benevolent Association that he had engaged a room at Ashley's Hotel, Covent Garden, for every Thursday evening, and cordially invited them to attend the meetings for discussing photographic matters.

The correspondence and other matters having been attended to, the meeting adjourned until June 1st.

Talk in the Studio.

MR. PRESTWICH, of the City Road, has sent us a sample of his dried gelatino-bromide pellicle, which we have tried, and find to yield very satisfactory results. Although the sensitiveness of plates coated with it was not quite so great as that of some commercial plates, this matter was more than compensated for by the clearness and vigour of the negatives obtained. We also tried some of the emulsion spread on paper, and found that by development with ferrous oxalate very excellent results were obtainable.

THE SWAN MEDAL.—Mr. W. Dubisson writes that he fears the offer of a silver medal will not appear sufficiently attractive to the poor photographer; "but Mr. Swan may, although he does not say so in his advertisement, liberally wrap the beautiful silver medal in a fifty—or perhaps a hundred pound note!"

CITY GUILDS INSTITUTE.—On Tuesday the foundation stone of the Technical College, Finsbury, was laid by Prince Leopold. The new college is founded under the auspices of the City and Guilds of London Institute for the advancement of technical education; and there can be no doubt that the good work commenced in the Cowper Street Schools will be carried on with increased vigour in the new building now being erected. A course of lectures on photography has already been given in connection with this Institute.

PHOTOGRAPHY AS A SAFEGUARD.—The *Golos* gives some curious details as to the means taken to ensure the safety of the Emperor at Gatschina. Every person arriving at the Palace, without exception, has to be subjected to a strict examination as to who he is, the reason of his coming, &c. All this is written down in a book, and, if considered satisfactory, he is carefully conveyed to the person with whom he has business. On leaving, his name is again written down, and he seen off the premises. All the servants and workmen employed are photographed, and carry one copy about them with a written certificate on the back, a duplicate being kept in the office.

To Correspondents.

*** We regret to say that want of space compels the postponement of "At Home," and the "Topic" "How I Keep my Books."

*** A cheque for two guineas will be given for the best practical essay "The Way to Preserve Negatives and Register Them." The following rules must be noted:—The article should be from one to two columns in length; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st June, marked outside, "The Way to Preserve Negatives and Register Them." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected MS. In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final.* The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

ARGENTO.—Sensitise in the usual way, and when the paper is dry, brush the back over with a solution of citric acid, containing from three to eight grains to the ounce, according to the length of time you intend to keep the paper.

A POOR PHOTO.—1. Others have experienced similar difficulties to those you write about, but if you will give us particulars we will do all we can to help. 2. We do not know of anyone at present, but your best course would be to insert an advertisement, setting forth what you require. 4. A lens of the rapid rectilinear or symmetrical type, and having a focus of about twenty inches, will answer well for both purposes.

SHIELD AND GREAVES.—You might take proceedings before a magistrate to enforce the return of the negatives, or perhaps a letter to the local police authorities might assist you.

QUERIST.—1. You cannot do better than to purchase the lens you name; but other things being equal, the same exposure will be required whether you use a 5 by 4 plate or an 8 by 5 plate. 2. It varies somewhat, but your friend is probably under the mark. One and four would be nearer in most cases.

ALF. J. BROWN.—1. Not merely as well, but better also. 2. Certainly, provided that the plate from which you enlarge is not larger than 8½ by 6½.

RICHARD PARR.—You seem to think that lenses of the best makers are turned out by some automatic process which can insure absolute identity in all respects; but this state of things will be impossible until means are found for making glass perfectly uniform in quality. As a matter of fact, the best opticians find it necessary to vary the curves in the case of individual lenses; and the maximum working aperture determined on often depends on the quality of the lens, or the purpose for which it is intended. The "elements" of the nine lenses you enquire about can only be ascertained by individual examination, unless, indeed, some record has been kept by the makers.

A. FREEMAN.—We have ourselves worked in a similar dark room without experiencing any inconvenience, but have heard of a case in which a tar and gravel floor appeared to cause fog in the case of wet plates.

L. CHAPMAN.—Rub well with French chalk or powdered steatite.

THOMAS TURBIN.—You could hardly select a less suitable place for the purpose, as it will be next to impossible to keep the sides of the room dry. If, however, you line the apartment with thin sheet zinc, it may answer your end fairly well.

PINE WOOD.—You might try; but we fear that the demand would not be large.

INQUIRER.—With moderate use it should last more than three months.

THE PHOTOGRAPHIC NEWS.

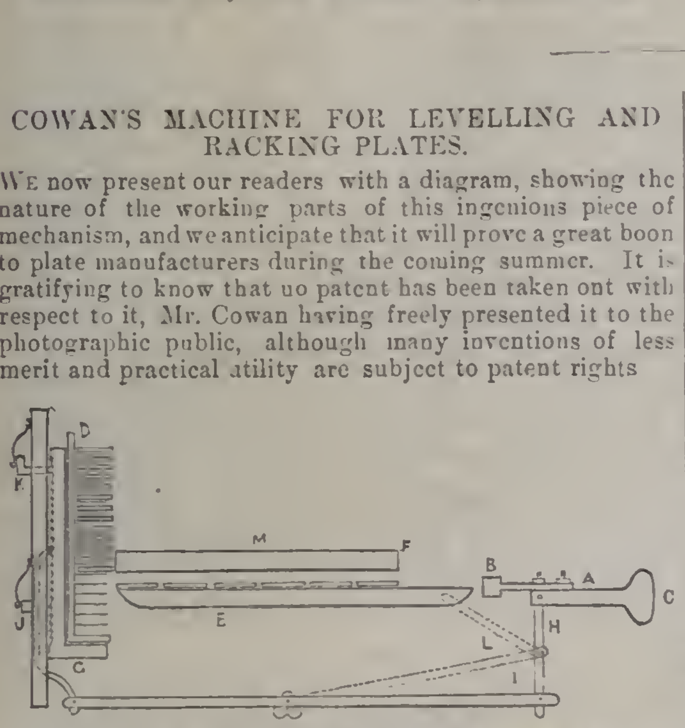
Vol. XXV. No. 1185.—May 20, 1881.

CONTENTS.

PAGE
Cowan's Machine for Levelling and Racking Plates ... 229
Mr. Warnerke's New Method ... 229
Mr. Samuel Robert Lock ... 230
A Simple Way of Producing Transparencies. By Robert Vincent ... 230
Modifications of the Detective Camera. By T. Bolas ... 231
Photography at the Cornwall Polytechnic Society ... 232
At Home—MM. Benque et Cie, in the Rue Boissy d'Anglas ... 232
Coloured Photographic Prints ... 233
Notes ... 234
How I Keep My Books. By a Lady (Mrs. Elizabeth H. Way) 235
French Correspondence. By Leon Vidal ... 236
Correspondence ... 237
Proceedings of Societies ... 238
Talk in the Studio ... 239
To Correspondents ... 240

COWAN'S MACHINE FOR LEVELLING AND RACKING PLATES.

We now present our readers with a diagram, showing the nature of the working parts of this ingenious piece of mechanism, and we anticipate that it will prove a great boon to plate manufacturers during the coming summer. It is gratifying to know that no patent has been taken out with respect to it, Mr. Cowan having freely presented it to the photographic public, although many inventions of less merit and practical utility are subject to patent rights



A. Block of wood working horizontally in guides, C being a pushing-piece for the hand of the worker. The return motion towards C is effected by springs not shown in the cut.

B. Adjustable buffer, so fixed on the block A, that when this is pushed forward to its limit, as at F, the distance between B and the back of the rack D is exactly measured by an ascertained number of the plates which are to be coated.

E. One of a pair of planed and levelled strips of iron, on which the plates ride forward towards the rack. Adjustable side pieces prevent any plates working out of a direct line while being pushed along the strips E.

G. A carriage or support for the plate racks, this being raised one degree each time the block A is drawn back by its springs; the action of levers H, I, and the lifting piece J, being made sufficiently clear by the diagram. The detent, K, serves to prevent the return of the carriage during the downward motion of J. When a fresh rack is placed on the carriage G, the detents K and J are drawn back by hand. The dotted lines at L show the position of the lever H, and part of I, when the sliding block A is in its most forward position.

M. A metal box which may serve as a cover in cool weather, or as an ice-box in hot weather, so that the emulsion shall become set before the plates reach the rack. In actual practice the bed E would be ten or twelve feet long, so that one end of the machine could be in the coating room, and the other end in the drying room.

D. One of a set of movable racks, formed with light shelves or projections to take the plates. The length of these projections will vary according to the size of the plates to be coated; but when small plates are being operated on, the rack must be placed more forward on the carriage, and the buffer B must, of course, be adjusted to the required position.

To use the machine, a rack is placed in position on the carriage, this being lowered by drawing back the detents K and J. The rails, E, are next covered with plates, and the sliding block A is pushed forward, this action serving to put the farthest plate on the top shelf of the rack. The springs governing A now come into action, drawing it back, and at the same time raising the rack-carriage one degree, while a space is left for the next plate between F and B. The same series of actions is repeated until the rack is full, a circumstance which is announced by the ringing of a bell, when the full rack is taken to the drying room, and a fresh one placed on the carriage of the machine.

In order that the forward motion of A may be easily made by a person who has just placed a plate between F and B, Mr. Cowan intends to arrange a kind of bell-pull action conveniently placed for the purpose.

◆

MR. WARNERKE'S NEW METHOD.

One of the most interesting and remarkable points in connection with Mr. Warnerke's new mode of working the gelatino-bromide process, as described in our leader of last week, consists in the fact that there is little or no tendency towards a reversal of the image when the emulsion is spread on paper instead of on glass, and this circumstance alone may partly account for the superior vigour and intensity of the negative obtainable.

It should be borne in mind, that for the transfer process one would naturally spread the emulsion rather more thickly on the paper than would be the case if it were intended to make the paper serve as a permanent support for the negative, even although the thinly-coated paper might really answer well. Supposing now that one negative were taken on the thickly-coated paper and allowed to remain thereon, while another was transferred to glass and washed by Mr. Warnerke's method; one would expect the latter to be much more vigorous, not only by reason of its being an actual solid image or relief, but also partly through the abolition or removal of that thick body of gelatine which may be regarded as extra thickness left for convenience of transfer.

It may turn out that by spreading the exact thickness of emulsion which is best adapted for the work required, on a fine paper, that negatives of a vigour comparable to those of Mr. Warnerke may be obtained; and we may mention that we have seen results by the earlier experimenters in this direction, more notably by Mr. Mawdsley, which lead us to hope for an extended use of emulsion paper in the future.

Those who have worked at the Talbotype and other similar processes know very well that a thin paper which shows considerable structure to the eye will often answer, for all practical purposes, as well as glass, for supporting a negative picture; especially if this paper be rendered more transparent by means of wax or a suitable varnish. It is extremely probable that for all pictures over 10 by 12, paper will form as good a support as glass, but with the notable advantage of offering great facilities for retouching.

Mr. Warnerke foreshadowed something which may be supposed to lead to a revolution in the present modes of pigment, or so-called carbon printing. He told us how pigments may be incorporated with emulsion, and this mixture, being spread on paper, may be treated by his method so as to yield solid or relief pictures which will of course contain the pigment together with metallic silver. The latter may, however, be removed by a solution of ferric sulphate, leaving nothing but pigment and gelatine. Most of the manipulations incident to the ordinary methods of single and double transfer carbon printing seem to have been imported bodily into Mr. Warnerke's process, but in connection with this matter there are some few points which may be noted. In the first place, exposure is so far reduced that in the case of Mr. Warnerke's method, work may be executed with the greatest facility by gas, lamp, or even candle light; but except in rare cases the advantage would be more than counterbalanced by the greater expense incurred for materials, and the more complex nature of the subsequent manipulations. It is probable, however, that Mr. Warnerke's prints might be kept any reasonable length of time after exposure and previous to development with pyrogallic, or after development and prior to mounting; while to keep exposed carbon tissue any great length of time is generally quite impracticable, owing to the continuing action of light and the advent of insolubility.

Other aspects of Mr. Warnerke's process must stand over for future consideration.

MR. SAMUEL ROBERT LOCK.

We regret to announce the death of a gentleman well known in connection with photography—Mr. Samuel Robert Lock, of the firm of Lock and Whitfield.

Mr. Lock was born in London, in 1822, and educated at King's College. Having a great desire to travel, his father permitted him to go to Australia at the early age of fifteen. His first employment there was in the Government Survey Office; having always had a natural aptitude for drawing, the work was congenial to his taste. He afterwards visited Tasmania, and later the Islands of the Pacific. A man of a most genial and amiable nature, wherever he went he formed friendships, many of which were true and lasting until the day of his death. Almost self-taught as regards miniature painting, he was so far successful as to maintain himself by painting the portraits of the colonists.

After having spent several years abroad, he returned to England, where he found the Talbotype process of photography astonishing the world, and immediately set himself to work to try the effect of painting these paper photographs in transparent water-colours, and he soon afterward obtained employment in the house of Henneman, the protégé of Mr. Fox Talbot. Scientific men admired the crude productions of the camera; but society hailed with delight the softening influence of the brush which Mr. Lock had brought to bear with his excellent eye for colour. The purity, transparency, and delicacy which characterised his earliest productions were always maintained. He abhorred body colour or oil, because he knew full well that to draw better than the camera was impossible, and how soon opaque colouring of any kind not only destroyed the outlines, but more particularly the delicate gradations and modelling of the photograph.

He remained for some little time with Mr. Henneman, and then opened a studio of miniature painting, in the Quadrant, almost opposite the famous Daguerreotypist, Claudet, perhaps hoping that some day he might gain a share of the patronage bestowed by the wealthy on this eminent man, as evidenced by the crowds of carriages which daily set down their fair occupants at his door. He had not to wait long, for his reputation for converting Talbotypes into beautiful miniatures spread rapidly. At that time, having no glass-room of his own, he used to paint photographs that were brought to him, or he would accompany his sitters to a photographer to be taken. Amongst these he became acquainted with his future partner, Mr. George C. Whitfield, a student of medicine, of King's College, who, during convalescence from an illness that befel him whilst walking the Hospital, had become enamoured of the new art, and, throwing physic to the dogs, had just built himself a studio in the lower part of Regent Street, adjoining Club Chambers (now the Junior Army and Navy Stores). In a few weeks an alliance was arranged, and business was soon after commenced—1st September, 1856—under the style of Lock and Whitfield, at 178, Regent Street, whither Mr. Lock had already removed from the Quadrant. A few years later the firm opened a studio at King's Road, Brighton, which, like the one in Regent Street, proved a great success. The favour that Mr. Lock met with as a photographic miniature painter to the Queen and Prince and Princess of Wales is pretty well known; and for a quarter of a century his productions have remained almost unrivalled. Mr. Lock was a partner in the Woodbury Company, which, we understand, is also a great commercial success.

His end was a melancholy surprise to his numerous friends. He had been for a pleasure trip for six months to Egypt, beyond the second cataract, returning by way of Greece, Sicily, and Italy. At Rome he caught cold, and then travelled homeward as rapidly as possible. He arrived at the house of his daughter on Friday evening, May 6th, and died of bronchitis on Monday, May 9th. He will always live in the hearts of those who knew him, to all of whom he was endeared by his genial and affectionate disposition, and by his generosity and integrity of purpose.

A SIMPLE WAY OF PRODUCING TRANSPARENCIES.

BY ROBERT VINCENT.

The general plan, now-a-days, is, I believe, to use a gas jet as the means of illumination. A negative is put into a printing-frame, a gelatine plate is placed above it, and when the pad and lid have been replaced, an exposure of a minute, or a fraction of a minute, is made in the dark room at some distance from an ordinary fish-tail burner. Nothing could well be simpler than this, except, perhaps, the plan I have used for some time past, and in which neither daylight nor artificial light is made use of. There is not always a gas-jet in the laboratory; in some cases it is absent from necessity, in others from choice, for sulphurous gas fumes are, after all, rather objectionable at close quarters.

My method is to make use of a standard illuminating power, and a very inexpensive one. I coat a piece of cardboard with the ordinary luminous paint—I do not think it costs a penny to cover a square foot—and this I have in a drawer of the dark room ready for use.

The printing-frame, containing the negative and gelatine plate, is placed face downwards upon the luminous card for three or four seconds (never over-expose if you want a vigorous transparency), and then you proceed to development. I employ oxalate usually, and secure excellent results; but, no doubt, pyrogallic development would answer as well. It goes without saying that the painted cardboard is exposed to daylight for an instant, to attain luminosity, before being used for printing. In my practical experiments I have found that it does not much matter whether the painted card is exposed to sunlight or ordinary daylight; its luminosity afterwards is very much the same. The gelatino-bromide paper may, of course, be printed in like manner, and under the most uniform conditions as regards a standand exposure and a standard developer.

Some time ago, I read of a Frenchman who produced prints in the dark; by the aid of luminous cardboard I performed the same *tour-de-main* without difficulty. I put my lighted cardboard in a table-drawer before the experiment, and then, by simply slipping the printing-frame (containing negative and gelatine plate) upon top of it, was presently enabled to develop an image without my comrade having seen where I got the light from.

* * *

MODIFICATIONS OF THE DETECTIVE CAMERA.

BY T. BOLAS.

The range-finding apparatus which formed a part of the original apparatus, as recently described in the Journal of the Photographic Society (January 21, 1881), and in the Photographic News, vol. xxv., p. 45, can well be dispensed with when the ordinary symmetrical lenses are used, as a little practice enables one to judge distance, and to take aim with sufficient accuracy for all practical purposes. When, on the other hand, portrait lenses, working with full aperture, are employed, the sharp definition of near objects cannot well be a matter of certainty if the distances are estimated by means of the eye; therefore, in such a case, the range-finder becomes a necessity. The model now to be described has been made for me by Mr. Collins, of St. John's Wood, and it is so constructed that it may be made to serve equally well as an ordinary tourist's camera, a focussing screen being introduced in the place of the slide, while a shutter can be opened so as to allow the image to be seen and the camera adjusted. Considering that the camera, including three double dark slides, is scarcely larger than the usual leather sling case, which serves to carry the ordinary quarter-plate bellows camera, the advantages of the "detective" camera are considerable. It takes the form of a small leather-covered case, 7 by 8½, by 6 inches, which may be carried into almost any place of public resort without attracting notice, and which may be locked up, and roughly handled like ordinary luggage.

The arrangement of the apparatus is shown by the following sectional drawing, which almost explains itself. A (fig. 1) is a double brass body resembling a lens mount, a rack and pinion being provided at B; this forms the expanding camera, and runners for the slides are attached to the brass work at G, while the position of the lens is shown at C. The cover of the outer case is hinged at the point D, so that the brass-bodied camera may be removed bodily, and without the disarrangement of any of its parts. At E may be seen the provision made for storing the extra slides and the focussing screen, these being made accessible by a door provided for the purpose. The pinion B is extended so as to terminate in a square, which is engaged by a clock key passed through a hole left for the purpose, and an index figure, attached to the pinion shaft, serves to indicate for what distance the camera is adjusted; while a door at the end E of the case can be opened when it is wished to focus in the ordinary manner.

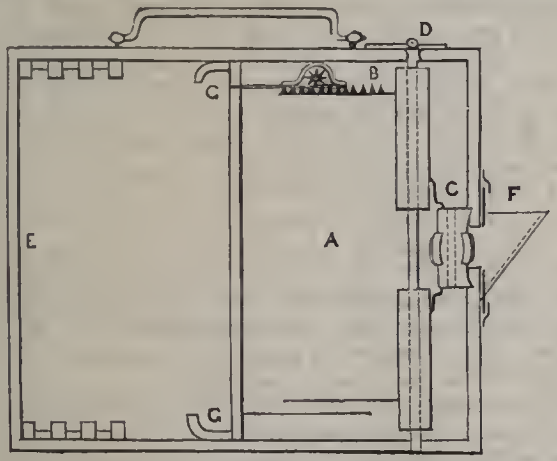


Fig. 1.

The form of shutter made use of is one which Mr. Collins has devised, and it is shown in fig. 2. A piece of thin ebonite, B A E C, shaped as shown, turns on a centre at B, a spiral spring and nut serving to increase the friction with which it works. The projection, C, passes through the lens mount between the glasses, an aperture corresponding to the lenses being cut out at E. When the catch D is raised, either by pressure on the stud I, which is level with the surface of the case, or by the action of a pneumatic arrangement against the projection F, the tension of the elastic band, G, causes a quick exposure. It is quite easy, however, to let the catch D back in time to stop the shutter at the step, H, when it remains open for any desired period, ready to be again closed by a fresh raising of the catch D. By means of these arrangements, the exposure is most perfectly under control, especially as the tension spring at the centre B may be so adjusted as to vary the speed of the shutter to a considerable extent. When the camera is placed on the ground for exposure, the point of sight is necessarily low; and in order to remedy this as far as practicable, I adopt the plan of attaching a reflecting prism over the lens aperture as shown at F (fig. 1), so that the camera may be placed with the end, E, downwards. The reflecting prism is also useful in some other cases, as, for example, when one wishes the camera to look round a corner without itself being made very obvious to the sight, or when it is important to obtain reversed negatives.

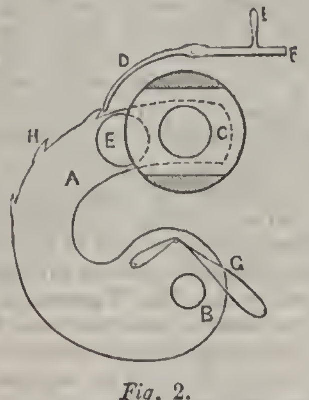


Fig. 2.

By adopting an electric release instead of the pneumatic, it becomes practicable to so connect the apparatus with a clock as to make the exposure at any required time; and by making use of a band of plates mounted after the fashion of a revolving stereoscope, the apparatus may be arranged to make a series of exposures at regular or irregular intervals, as may be required; or exposure may follow the opening of a door, drawer, box, or gate. Supposing, for example, it were desired to secure a portrait of each person passing through a certain doorway or gate, the position might be accurately focussed by a portrait lens, and the exposures could be made at the right instant by arranging an electrical contact to be worked by means of a tread or step.

I am now engaged in making a camera in the form of an opera-glass, one barrel serving as a finder, and the other as a camera; as, in this case, accurate focussing becomes practicable, lenses of large aperture may be employed. Opera-glass cameras have already been made; but up to the present time certain practical inconveniences have prevented extensive use being made of these instruments. In using such an apparatus, it will be necessary, in almost every case, to steady it by resting it against some firm object.

PHOTOGRAPHY AT THE CORNWALL POLYTECHNIC SOCIETY.

JUDGES' REPORT.

THE following is the official report of the judges (Messrs. W. Naylor Carne, T. Hart, and W. Brooks).

The Judges have great pleasure in congratulating the Society on the quality and general excellence of the exhibits, although the number is about the same as last year which was considered slightly below the average of former years. Again the gelatine process is well to the front, and with good results. More than two-thirds of the pictures exhibited have been taken by it.

Professional.—Mr. H. P. Robinson, of Tunbridge Wells, has been awarded the Society's first silver medal for his excellent production, "At Gwysaney Hall." It is one of the finest photographs of the kind we have ever seen, and taken on a gelatine plate. Mr. Robinson's productions are so well known that it is useless for us to attempt to describe them in detail. He sends also several other works, "A Study in Sheep," "In Maiden Meditation Fancy Free," and "Dorothy," an interior with a female figure most artistically posed. Messrs. Hill and Saunders, of Bayswater, have been awarded a second silver medal for a portrait study of a boy, printed on opal in carbon. It it had been a direct negative, a first silver medal would have been awarded. Independent of the pose, it is soft, delicate, and brilliant, and the effect is truly wonderful. Mr. Arthur Debenham, of the Isle of Wight, sends a fair collection of portraits and studies, very soft and delicate; a first bronze medal has been awarded to them. Mr. H. G. Cocking sends three frames, namely, a "Country Election Agent," "Desolato," and "Nancy Lee." The first-named cannot be admired, being rather coarse and vulgar; the other two are far below the average of Mr. Cocking's work of former years. Mr. E. S. Baker has been awarded a second silver medal for a landscape, "A Worcester Lane," being a very artistic production, and a well-chosen subject. Mr. A. B. Thom sends "The Elephant Jumbo and his keeper Scott," which possesses some very good points. Messrs. Lock and Whitfield send some fine productions in carbon, which are very rich in tone; especially noticeable is a portrait of a gentleman, and a study, "Babes in the Wood." We again have some of the admirable work of Mr. Adam Distin. "Relics of the Past" is very fine—a cottage interior with an old woman turning out the contents of an old trunk; this has been awarded a first bronze medal. Mr. J. Milman Brown contributes a series of rustic studies, &c.; a "Walk in Shanklin Chine" is very effective. M. T. G. Whaite, of Brighton, has several frames of studies, principally interiors (drawing rooms). and bits on the coast at Brighton; they are very brilliant and fine in tone, and speak well for the capabilities of gelatine: a first bronze medal has been awarded for the series. Mr. Reuben Mitchell sends three frames, the best of which is "Lynmouth Harbour, N. Devon," but we think he is not quite up to his usual standard. A very interesting series has been sent by Messrs. Marsh, Bros., Henley-on-Thames; one frame is instantaneous studies of Swans, which are very soft and delicate, also an instantaneous photo of "The Flying Dutchman Express" going at the rate of sixty miles per hour; it is quite perfect in every respect, taken on one of Fry's gelatine plates. Also is noticeable "Henley Regatta," and "Angling on the Thames." A first bronze medal has been awarded for the series. Messrs. J. Markham and Co. send two composition pictures which are rather under-exposed and heavy. Mr. J. B. Blow sends two enlargements of a "Cornish Fishing Village," printed in carbon, which are spoiled for the want of a sky being printed in. Mr. F. A. Bridgo has been awarded a second bronze medal for a frame of botanical studies, natural size (cones), which show great skill in manipulation. He also sends a fine enlargement in carbon, "Group of Students," City of London College. Mr. Edgar Gaol, of Falmouth, has some very good specimens of portraits taken on gelatine plates, which are very delicate, soft and brilliant, and well lighted. Mr. J. W. Moor, also of Falmouth, sends several frames of portraits.

Amateur.—Mr. T. M. Brownrigg is well to the front this year, and has been awarded a second silver medal for a very fine collection. One frame is of woodland scenery, taken on gelatine plates, which are better than any that we have seen of his. The other frames are instantaneous studies, one a bathing party; one figure is actually taken in the act of diving, with body immersed, and legs and feet up out of the water, which is very remarkable. Several street scenes, including "Guildford Market Day," are very fine. The award is the highest given, in the Amateur department. Mr. C. A. Fernley, of Reigate sends some very good sketches, "Tintern Abbey," and some water scenes. We note a very great improvement in his work to former years. These are also by gelatine. A first bronze medal has been awarded to Mr. John Hinley for a series illustrating "Life in the Bush, Australia," which are very interesting, and some of them have been taken under great difficulty. Mr. C. J. Collins sends a few interesting instantaneous sketches of boats, &c., which fully illustrate the rapidity with which boats in motion can be taken. Mr. J. Jackson contributes four frames of studies, cabinet size, a little under-exposed, but well chosen, and at the same time possessing great merit in certain points.

At Home.

MM. BENQUE ET CIE. IN THE RUE BOISSY D'ANGLAS.

A HANDSOME salon on the first floor is a fitting reception room to the studio, which of late years has attained such high reputation, both in Paris and in Milan, as that of MM. Benque et Cie. Fluted columns, draped with rich maroon curtains, are at the entrance to this apartment, into which not a ray of direct sunlight enters. All is soft and sombre within. There are extensive windows, but these are hidden by loosely festooned drab silk, so that while there is plenty of illumination, it is subdued and yet refulgent. The walls are of chocolate brown, the damask chairs and furniture gold and black, the fittings rich and handsome. This fine carbon portrait in frame complete, standing a metre high (39 inches) is a speciality of the firm Benque et Cie., and sells for a thousand francs. These pictures on the table are what is termed the "Paris-portrait," similar in height to the panel or promenade, but half an inch broader, a very attractive size, but still, to our thinking, not so elegant in its proportions as the promenade. Of cabinets, there is also a collection, not large, for we believe that there are not more than a score of photographs in the whole salon. Two or three cartes are here also, but during the past three months, our host tells us, not a single carte picture has been taken in the establishment. Here, too, we find Madame Nilsson, not in a frame, but in the flesh; she is looking at some portraits of sister artistes, after undergoing a lengthened sitting. "We have just taken one hundred clichés," our friend whispers, "and within the space of an hour and a half."

Before we walk upstairs, we are presented with a card of terms. Here it is:—

12	Cartes-de-Visite	 30	francs
	The dozen following	 20	,,
12	Cabinet Portraits	 80	,,
6	,, ,,	 50	,,
	The dozen following	 60	,,
12	Paris Portraits	 120	,,
6	,, ,,	 80	,,
	The dozen following	 100	,,

In the Benque establishment, gelatine reigns supreme. "Do you develop at once, or in the evening?" we ask. "Always in the evening—we are now so confident of our results; of those hundred clichés just taken of Madame Nilsson, not one will be developed till to-night." The development is done by artificial light, by means of a gas-burner behind ruby glass, a convenient tap permitting the photographer to heighten and lower the jet at will. The developing, too, for the most part is done mechanically. As soon as some idea has been obtained of the exposure of the plate, and the time and strength of development, half-a-dozen clichés are put together into a rocking tray. The developer is poured over the films, and then the tray rocks to and fro by itself, kept in motion by a heavy pendulum that swings underneath. It saves a world of trouble, our host tells us, and produces very uniform results. We always like to take the sense of photographers on the development of dry plates, and we put the question whether pyrogallic or oxalate treatment is preferred. "Oxalate, toujours—Oxalate toujours"—is the energetic reply.

The studio is large and roomy—the largest in Paris, our friend says; at any rate, it measures fifteen metres (nearly fifty feet in length). There is nothing particular to be noted about the lighting; top-light is the dominant light. The walls are of very dark brown, and we remark upon this. They are dark, admits our host; but when they are again painted, we shall colour them darker still. Large plates are in general use at the Benque Establishment, and large cameras. As a rule, six poses are taken on one plate. We mentioned the other day the circumstance of Madame Judic being pourtrayed 132 times in this studio at one sitting. She was at the atelier for two hours only, and, during that time, changed her dress four times. Twenty-two poses were taken, of each six clichés, with an exposure of about three seconds. The negatives were developed at night, and there were only two technical failures. "Elle ne voyait plus," when she went away after the ordeal, our host remarked of the fair comedienne. Certainly, such rapid work could not have been undertaken before the days of gelatine. There is no dark-room adjacent to the studio; the plates in their slides are sent up a shaft from the laboratory below, and delivered close to the assistant's hand in the studio, after the manner of Messrs. Window and Grove's studio, which we described the other day. The exposures are made by means of the ordinary pneumatic-Cadett shutter.

In the enlarging-room there is one point worthy of mention. The camera is disposed pretty well as usual; but just in front of the transparency is placed a swing looking-glass or mirror, perhaps twenty inches high. This permits, in a most convenient manner, the concentration upon the transparency of light that comes through a small opening in the wall, and if the mirror is turned to its proper angle by hand, the hand being never quite steady, no partial lighting is likely to ensue.

There are two printing-rooms, and MM. Benque send the negatives to one or the other, according to their density. Thus in the top printing-room, which is on the roof, the denser clichés are to be found, and those which will bear strong light; while in the more subdued light of the lower printing room are located such clichés as require more delicate treatment. From 1,200 to 2,000 prints are produced here every day, for the firm has now a large publishing connection, and their portraits go to every capital in Europe. Printing to this extent would be impossible in a London atmosphere, and for this reason our big metropolitan firms have usually an establishment in the suburbs for the purpose. But in Paris they burn charcoal more than they do coal, and, moreover, when this is used, it is of a much less sooty character than that employed in this country.

Starch, prepared fresh every day, is invariably employed for mounting at the Benque establishment; where so much publishing is done it is a matter of imperative necessity that the mounting should be depended upon, especially as black mounts are largely used just now. We are glad to hear, by the way, that of late these black mounts are more satisfactory than was the case a short time ago. Numerous cases of fading were then rife, and the cause, as our readers know, Mr. Spiller was able to trace to the presence in the mount of a considerable quantity of sodium chloride, or common salt. The test to discover this—namely, the adding of a few drops of nitrate of silver solution to water in which one of these has been steeped for some hours, and observing whether any turbidity results—is so simple that any photographer can make use of it for himself.

Besides making itself known through its publications, the firm also adopts the practice of exhibiting its works largely in Paris. The Boissy d'Anglas, although a turning out of the Faubourg St. Honoré, is not a very frequented thoroughfare, and hence visitors to Paris might well escape seeing the studio. MM. Benque et Cie. have, therefore, opened an exhibition in the Rue Royale, that familiar street leading from the Madeleine to the Place de la Concorde, and here a display of the firm's finest work is exhibited. A *pièce de resistance* is always present in the form of a scene from one of the Paris plays. Whatever happens to be popular on the boards for the moment, is here illustrated. The boat-scene from Michael Strogoff is the present attraction, a fine enlargement from nature, measuring perhaps three feet across, and including the portraits of half a dozen favourites. Any scene is chosen in which many characters are grouped, and the photograph being well executed, it naturally draws considerable attention. A magnificent portrait of Gounod, another of Judic, and a forcible picture of that Swedish professor with the hard name who discovered the North East passage, are also attractions at the little exhibition in the Rue Royale.

The "By-the-Bye" next week will be "The Publication of Photographs"; the following "At Home" will be "At the Prefécture de la Police, in Paris."

COLOURED PHOTOGRAPHIC PRINTS.

We believe this much talked-of patent of the Colour Photographic Company has now elapsed.

This process consists in obtaining colour photographs by means of two impressions from the negative, the first being a weak impression in order to give the outline for guiding the application of the colouring, and the second, after the colours have been applied, being an impression of sufficient strength to give the clear drawing, lights and shadows, and details of the picture.

In carrying out this process, I first take the negative in the ordinary manner. I then print on salted paper, already sensitized, a very light or faint proof of each negative, fixed and washed in the usual way. When dry I immerse the print for two or three seconds only in pure alcohol, then dry it again, and afterwards pass it through the rolling-press. The print is then coloured with an ordinary hair-pencil in vegetable colours, the various tints being laid on smoothly, flatly, and lightly, without any regard to shading or softening off, but care being taken to have the tints brighter than they are intended to be finally. The colours are applied with the following mixture instead of with water:—

Albumen of egg..	...	...	100 grammes
Distilled water ...	...	...	25 "
Pure glycerine ...	...	...	25 "
Sal-ammoniac ...	...	...	5 "
Liquid ammonia...	...	...	4 drops

It will be found that the print will colour more easily if it be slightly moistened and placed on a piece of glass. After the print has been coloured, it is again passed through the rolling-press. When perfectly dry, the coloured proof is immersed for a second time in pure alcohol, and is then albumenized in a bath composed as follows:—Whites of egg are beaten up, with two grammes of very pure sal-ammoniac added for every three whites of egg, 20 per cent. of distilled water, and about 4 drops of acetic acid for every 100 grammes of albumen. All is beaten up until the liquid attains a snowy appearance, when it is left at least eight days to stand. It is then decanted and ready for the coloured print, which should be carefully passed over the bath and allowed to remain floating about sixty seconds. The print is then dried by heat, and finally passed through a sensitizing bath in order to be ready for the second impression. This bath is composed as follows:—

Distilled water ...	...	...	1000 grammes
Nitrate of silver ...	...	...	100 "

The proof is again dried, but this time not by heat, and a second impression, stronger than the first, is then taken by laying the negative very accurately over the first impression, so that all outlines, &c., rigidly correspond. This has the effect of establishing the picture, throwing out high lights, &c. The proof is then toned and fixed in the usual way, and can be afterwards enamelled.

Notes.

Many of our readers will peruse with curiosity the specification of the patent of the Colour Photographic Company we print elsewhere. We believe everybody is now at liberty to produce photographs in natural colours by this process, if they can.

"I don't like them," says the duchess. It is her Grace of Edinburgh who speaks, and it was the promenade portrait she refers to. Mr. Downey considers the royal dictum a bad omen. "I remember," he tells us, afterwards, "Her Majesty did not approve of portraits with enamelled surfaces when I submitted some to her at Balmoral many years ago, and they never became popular." There may be truth in this, for enamelled portraits never attained in this country to the high estimation in which they are held in France, Germany, and even in Russia.

Let us listen once more. Ordinary tittle-tattle is not very edifying, but her Imperial Highness is not an ordinary mortal. The duchess stands in Mr. Downey's new opaline studio, and evidently appreciates dry plates, for presently she remarks: "This is not like a photographer's; there is no smell; it is certainly the nicest studio I ever was in." M. Levitsky, the court photographer at St. Petersburgh, we remarked the other day, employs the wet process for his electric light pictures, and no doubt the imperial experience of photography has mainly been gained in that ether-perfumed establishment.

Messrs. Elliott and Fry, we regret to hear, were disappointed of a sitting by the late Lord Beaconsfield; but for the Earl's sudden illness, he would have sat to the firm in the first days of spring.

Mr. W. J. A. Grant has sailed north once more in the little Polar ship, *Willem Barents.* This is the fifth time Mr. Grant has acted as photographer in a polar expedition; his admirable picture and his paper on "Photography in the Arctic Regions" in the last YEAR-BOOK are still fresh in the memory of our readers. The little ship musters a captain, two mates, doctor, photographer, zoologist, and but six sailors.

A large magneto-electric machine has been established at the office of *Arts et Métiers* in Paris, for the purpose of purveying electricity to several adjacent laboratories. "Electricity sent out," might well be placarded over the door of the establishment. So far, we are told, the electric supply has only been used by photographers.

The Frankfort Photographic Exhibition is announced to be held from the 24th to 29th August during the conference of German photographers. No medals will be awarded, but three prizes, consisting of a time-piece in marble and bronze, two large photo-engravings by Goupil, and a set of majolica ornaments. They will be given respectively for the six best cabinet photographs of head studies, groups, and full-length children portraits.

Dr. Eder will shortly contribute a paper on washing gelatine emulsion; he also promises a new and practical method of estimating soluble bromide in emulsion.

Herr Wilde, of Goerlitz, described at the last meeting of the Vienna Photographic Society, a new form of emulsion. He combines an alcoholic gelatine emulsion with resin, attaining thereby, if not increased sensitiveness, at any rate a firmer film.

The Vienna Society invites competition from members and non-members for three gold medals of the value of 140 ducats each (about £67). The first is to be awarded for a mechanical printing process in relief or intaglio, giving the half-tones of photography; the second for the best essay upon pyroxylin and collodion; and the third for an improved collotype process in which no intermittent damping of the plate is necessary. Further particulars are given in the current number of the *Correspondenz.*

Messrs. Theyer et Hardmuth, music publishers, have resorted to photography for producing small editions of their publications. The sheets are about cabinet size, and evidently reproduced by the phototype process, to which we referred the other day. Tiny music portfolios may also be purchased which fit into the breast pocket. "La Pipe *à* Papa," and "Un dejeuner sur l'heure," have been forwarded to us. We cannot too strongly recommend the Eder and Toth lead intensifying process for producing negatives with clear lines on a dense ground, necessary in working a photo-etching process.

Tissue paper applied to the back of the negative, and then carefully oiled in places to render it transparent, is suggested to us as a good plan of improving the density of a negative in parts where it lacks printing power. The paper is left *unoiled* where increase of density is required.

If the promenade portrait has not made much progress during the past year, it has, at any rate, found a most aristocratic application. Its lengthy proportions are admirably adapted to showing off a lady's train, and hence the fine dame who has just been presented, usually chooses the promenade format. Court, or drawing room, portrait should have been its proper name.

We spent Saturday afternoon among the despised pictures at the Albert Hall. Unfortunately, there are not, as at Burlington House, a sufficient number of good works to make the exhibition attractive, nor, again, as in the Royal Academy, enough bad ones to make it interesting. By the way, in the whole catalogue there is only a single painting marked "R. A., conditionally accepted." After journeying all the way to Kensington Gore, finding one's way along the cold corridors, and ascending a hundred feet or more in a lift, we certainly hoped for something better; to quote the elder Mr. Weller, "Vether it's worth while goin' through so much, to learn so little, as the charity-boy said ven he got to the end of the alphabet, is a matter o' taste. I raythor think it isn't."

HOW I KEEP MY BOOKS.

BY A LADY (MRS. ELIZABETH H. WAY).

From many years' practical knowledge of the requirements of photographic book-keeping, and of the confusion and loss occasioned where books have been carelessly kept—or, rather, not kept—I have been able to establish a system which has been found to fully meet the requirements of businesses of a varied character. There must, of course, be a wide difference between the books necessary to be kept in a busy ready-money business, and one where credit is the rule; but this is so apparent, that it is not necessary for me to do more than allude to it. In this paper I shall strive to explain how I keep my books, and give some examples from them.

First, then, as a matter of primary importance, let every order and direction that is given by the customer be fully and clearly taken down, so that any one, at any time, may know exactly what is required; also, how, and when, the orders are executed. Some book-keepers are proud of a memory which will carry the minutest details of many orders, and feel flattered in being constantly consulted, or have a sense of security in their position in the thought that they alone possess this knowledge; this is unbusiness-like, and occasions serious loss of time and energy.

The principal books we require are a day-book, in which is entered all the orders given each day; ledger, to which all accounts, whether cash transactions or not, should be transferred; and a cash-book, showing—so far as we are now concerned—the receipts, these receipts being afterwards transferred to the credit of the customer in the ledger.

Besides these, there would be a petty cash-book, postage-book, and a waste or scribbling-book. The last I have found especially useful for taking down particulars of what are not strictly orders, and cannot, therefore, be entered into the day-book. For instance, a lady speaks of sending her child the next day with a servant, and desires a certain style of picture, mount, or arrangement made. Such particulars could not be entered in the day-book, as no sitting is taken, or order actually given; yet it is essential that a note should be taken of the intending customer's requirements. The postage-book should be carefully kept for reference in case of miscarriage of a packet, as also delivery books, if kept. With a word of caution against carelessness in the management of the appointment book, if appointments are made, we may dismiss these books, which are neither complicated in detail, nor difficult to manage, and direct our attention to the "books" proper—the day-book, ledger, and cash-book.

The day-book should be ruled to allow of the following entries:—No. of negative (or order, if negative number is not given to the book-keeper), name and address of sitter, details of order, the amount, proofs, when sent, returned, order executed, ledger folio, remarks relating to the execution of the order, &c.

Folio 17.

DAY BOOK.

Monday, September 1st, 1880.

Neg. No.	Name and Address.	Order.	Amount.	Proofs sent.	Proofs returned.	Order executed.	Folio of Ledger.	Remarks.
1771	Lady Mary Hall, 12, Rutland Gate, S.W.	6. Vigs. 1 Coloured. Mount Paid Sept. 1	£1 1 0 0 10 6 0 7 6 £1 19 0	Sept. 4	Sept. 6	Sept. 13, 5 ,, 17, 1 coloured and Mount	27	Proofs to be sent not later than 5th inst.
1772	Mrs. G. Warren, 119, Piccadilly, W.	Miniature (No. 3 size)	2 2 0	Sept. 3	Sept. 5	Sept. 16	27	Locket to be sent. ,, sent 5th inst.
1773	Miss Maud Hart, 17, St. James's Street, W.	6 C.D.V.	—	Sept. 4	Sept. 7	—		Order countermanded. Will sit again.

Tuesday, September 2nd, 1880.

1774	Alex. Perry, Esq. Moor Hall, Harlow, Essex.	1 large Vig. Oval Frame Packing Case Paid Sept. 5	£2 2 0 0 18 0 0 2 0 £3 2 0	Sept. 6	Sept. 10	Sept. 21	27	To be sent by Sutton and Co.
1775	Mrs. B. Smith, 12, Marine Parade, Brighton, till 5th inst. 17, Cromwell Rd., S.W.	6 Vigs. 3 full and 3 profile.	1 1 0	Sept. 5	Sept. 9	Sept. 14		Wanted as soon as possible.

In the examples I have given of the day-book, the first transaction—an order—is paid at the time of sitting, and is at once entered in the day and cash-book, the date of payment in each book corresponding; the second, third, and fourth, unpaid, illustrate the way orders are booked. The last entry is left without the No. of ledger folio, and would show that the order had not been entered in the ledger, the folio of which must be added when the order is carried into the ledger. And here it may not be out of place to say how important it is that the day-book should be posted frequently (daily, if possible); and, at the same time, the index of day-book and ledger very accurately and distinctly kept, the surname, Christian name, and title following. Much difficulty is frequently caused if this is neglected.

Ledger. LADY MARY HALL, 12, Rutland Gate, S.W. 27

Dr.		Day Book F.		Cr.		Cash Book F.	
1880				1880			
Sept. 1...	6 Vigs. ...	17 ...	1 1 0	Sept. 1...	By Cash...	10 ...	£1 19 0
	1 Clrd. ...	...	0 10 6				
	Mount ...	...	0 7 6				
			£1 19 0				£1 19 0

MRS. GEO. WARREN, 119, Piccadilly, W.

Sept. 1...	Miniature	17 ...	2 2 0	

ALEX. PERRY, Esq., Moor Hall, Harlow, Essex.

Sept. 2...	1 lg. Vig.	18 ...	2 2 0	Sept 5...	By Cash ...	11 ..	£3 2 0
	Frame ...	..	0 18 0				
	Pkg. Case	...	0 2 0				
			£3 2 0				£3 2 0

In the ledger each payment is then transferred to the credit of the customer, against the items of the account, examples of these entries being found on the right hand side of the ledger, each transaction being ruled off on its being settled. From this you will see, looking at the page of the ledger I have given, that on the left hand or debtor side of the page, the items are copied from the day-book, and represent the indebtedness of the customer to the business; and on the right hand or creditor side of the page, extracts from the cash-book, being the payments from the customer in discharge of the debt—this, whether the money is paid at the time of the order, or two or three years after. It may be urged that, when pictures are paid for at the time of ordering, the entry had best be closed up in the day-book; but this may lead to confusion.

The ledger, too, with its alphabetical index, is very convenient for reference in cases where orders are repeated, and saves loss of time in turning over old day-books. I have found it advisable to make the ledger entries at full-length, instead of merely transferring the total of each account, so that it forms a complete record of the business done with every customer.

In the ledger, then, every transaction is to be entered; if paid at the time of the order it is entered as the first example, having folio of the day, and cash-book; if as the second, not paid, with the day-book folio only; in the third, the order is entered on the day it is given and credit given, and the cash-book folio added when the amount is received.

The cash-book may or may not be the cash-book of the business. If it is, every money transaction, payment or receipt, passes through its pages, and a balance should be struck each day. In its simpler form it would merely be a book recording receipts; but in it every payment made should find place, whether at the time the pictures are ordered, or in settlement of an account. It will not be necessary to give an example of cash-book entries; suffice it to say, that when an account is received, the amount should be *at once* entered, full name and description being given, especially where the patronymic is not a specially distinctive one. I have often seen much trouble made by a careless person receiving an account and giving a receipt, without taking note of the name—probably, not reading it even. A Mr. Smith or a Miss Brown should be distinguished by their Christian name to avoid mistake. Though, in a case of this kind, the amount received *may* guide us, trouble is given, and risk of error caused by such negligence.

In conclusion, I will merely express the hope that those who are at present in difficulty with their accounts may be at a little pains to master the very simple system I have endeavoured to explain, and enjoy the absence of worry and uncertainty they can only experience in having fairly kept books.

FRENCH CORRESPONDENCE.

MR. WARNERKE'S NEW DISCOVERY OF CONVERTING NEGATIVES DIRECTLY INTO POSITIVES—CAPTAIN BING'S EXPERIMENTS ON THE SENSITIVENESS OF COAL OIL—BITUMEN PLATES—TOPOGRAPHIC ENGRAVING BY COMMANDANT DE LA NOE—SUCCINATE OF IRON DEVELOPER—FRIABLE HYDRO-CELLULOSE.

Mr Warnerke's New Discovery—Very happily for our art, we are at the present moment entering upon a stage of improvement which shows that photography is advancing with vast strides towards a position that has the possibility of a marvellous future. In England, especially, great advances are being made. The recent experiments of our accomplished colleague, Mr. Warnerke, on gelatine rendered insoluble by light, after it has been sensitized by silver bromide and developed by pyrogallic acid, have revealed to us a number of new facts whose valuable results it is impossible at present to foretell. It seems, however, certain that we shall thus be able to accomplish very nearly the same effects as those obtained by bichromatised gelatine, but with the additional advantage of a much greater rapidity in all the operations. In my own experiments with the new process of phototypie, I hit upon the plan of plunging the carbon image, from which all soluble gelatine had been removed, into a bath of pyrogallic acid, in order to still further render impermeable the substance forming the printing surface. I also conceived the idea of afterwards saturating this carbon image with a solution of nitrate of silver, and of subsequently treating it with pyrogallic acid, in order to still further render impermeable the substance forming the printing surface. I also conceived the idea of afterwards saturating this carbon image with a solution of nitrate of silver, and of subsequently treating it with pyrogallic acid. But the process described by Mr Warnerke is quite different; by means of it we shall be able to fix the image taken in the camera, in the same way as we develop carbon pictures, and afterwards to employ them in any manner that may be desirable. Thus the positive process of carbon printing would be modified in such a manner that the mixtures containing the permanent pigment should be sensitized with silver bromide in place of potassium bichromate. In this way impressions could be very rapidly taken of positive proofs, and enlargements made, which might be developed in hot water, just as in the ordinary carbon process, and at least we should have permanent images. Mr. Warnerke's highly interesting experiments will no doubt open the way to many valuable applications, and will realize a marked progress in the art of photography.

Method for Converting Negatives Directly into Positives.—Captain Bing, who is employed in the topographic studios of the Ministry of War, has devised a process for the direct conversion of negatives into positives. The idea is not a new one; but several experimenters, and notably the late Thomas Sutton, have pointed out the means of effecting this conversion; it has never, however, so far as I know, been introduced into actual practice, as is now the case. The process which I am about to describe is now worked in the studios of the Topographic Service. The negative image is developed in the ordinary way, but the development is carried much further than if it were to be used as an ordinary negative. After developing and thoroughly washing, the negative is placed on a black cloth with the collodion side downwards, and exposed to diffuse light for a time, which varies from a few seconds to two or three minutes, according to the intensity of the plate. Afterwards the conversion is effected by moistening the plate afresh, and then plunging it into a bath which is thus composed:—

Water	... 700 cub. cents.
Potassium bichromate	... 30 grams
Pure nitric acid ...	... 300 cub. cents.

In a few minutes this solution will dissolve all the reduced silver forming the negative; the negative image is therefore entirely destroyed; but it has served to impress on the sensitive film beneath it a positive image, which is still in a latent condition. It must, therefore, be developed, and, to do this, the film is treated with a solution of—

Water	1,000 grains
Pyrogallic acid	25 ,,
Citric acid	20 ,,
Alcohol of 36°	50 cub. cents.

The process is carried on exactly as if developing an ordinary negative; but the action of the developer is stopped at the precise moment when the positive has acquired intensity sufficient for the purpose for which it is to be used. Fixing, varnishing, &c., are then carried on in the usual way. The great advantage of this process consists in the fact of its rendering positives of much greater delicacy than those that are taken by contact; and, on the other hand, by means of it we are able to avoid two distinct operations, when for certain kinds of work we require positive plates where a negative would be of no service. M. V. Rau, the assistant who has carried out this process under the direction of Captain Bing, has described it in a work which has just been published by M. Gauthier-Villars.

Experiments of Captain Bing on the Sensitiveness of Coal Oil.—The same Captain of Engineers has undertaken a series of very interesting experiments on the sensitiveness to light of one or two substances to which bitumen probably owes its sensitiveness, but which, contrary to what takes place with bitumen, are capable of rendering very beautiful half tones, both on polished zinc and on albumenized paper. These sensitive substances are extracted by dissolving marine-glue or coal-tar in benzine. By exposure to light, both marine-glue and coal-tar turn of a sepia colour, and, in a printing-frame, they render a visible image, which is not the case with bitumen; their solvents are in the order of their energy: chloroform, ether, benzine, turpentine, petroleum spirit, and alcohol. Of these solvents, benzine is the best adapted for reducing the substances to a fluid state, so as to enable them to flow over the zinc. The images obtained, which are permanent, and which are very much like those of the Daguerreotype, are fixed by means of the turpentine and petroleum spirit. They are washed with water, and then carefully dried. It is possible to obtain prints with half-tones in fatty ink by means of plates of zinc coated with marine-glue. Some attempts in this direction were shown to me, which promised very well in this respect. We are, therefore, in the right road, not only for economically producing permanent prints on paper, but also for making zinc plates in which the phototype film of bichromatized gelatine is replaced by a solution of marine-glue and benzine. The substance known in commerce under the name of pitch or coal-tar will produce the same results.

Bitumen Plates.—A new method of making bitumen plates by contact has also been introduced into the topographical studios. The plan, or the original drawing, is placed against a glass plate, coated with a mixture of bitumen and of marine-glue dissolved in benzine. The marine-glue gives the bitumen greater pliancy, and prevents it from scaling off when rubbed, particularly when the plate is retouched with a dry point. These bitumen plates are so thoroughly opaque to the penetration of the actinic rays, that the printing-frame may be left for any time in full sunlight without any fear of fog being produced on the zinc plate from which the prints are to be taken.

Method for Topographic Engraving by Commandant de la Noë.—Before leaving the interesting studios of which I have been speaking, I ought to mention a very ingenious application which has been made of a process called *topogravure*, invented by Commandant de la Noë, who is the Director of this important department. A plate of polished zinc is coated with bitumen in the usual way, and then exposed directly to the light under an original drawing, or even under a printed plan. So soon as the light has sufficiently acted, which may be seen by means of photometric bands equally transparent as the plate, all the bitumen not acted upon is dissolved. As it is a positive which has acted as matrix, the uncovered zinc indicates the design, and the ground remains coated with insoluble bitumen. The plate is then etched with a weak solution of nitric acid in water, and the lines of the design are thus slightly engraved; the surface is then re-coated with another layer of bitumen, which fills up all the hollows, and it is then rubbed down with charcoal. All the surface is thus cleaned off, and the only bitumen which remains is that in the lines, which, though not deep, are sufficiently so to protect the substance from the rubbing of the charcoal. When this is done we have an engraved plate, which can be printed from, like a lithographic stone; it is gummed and wetted in the usual way, and it gives prints of much greater delicacy and purity than those taken directly from the bitumen. The ink is retained by the slight projection of the surface beyond the line, so that it cannot spread, and a kind of copper plate engraving is taken by lithographic printing. Besides, in arriving at this result, there is the advantage of being able to use directly the original plans and drawings, without being obliged to have recourse to a plate taken in the camera; the latter is indispensable for printing in the usual way on bitumen where the impression on the sensitive film is obtained by means of a negative. It will be seen that this process is exceedingly ingenious, and not only is its application very easy, but all its details are essentially practical.

Succinate of Iron Developer.—I have received a letter from M. Borlinetto, in which he states that he has been induced by the analogy which exists between oxalic and succinic acids to try whether succinate of iron can be substituted for oxalate of iron as a developer. To prove this he prepared some proto-succinate of iron from the succinate of potassium and proto-sulphate of iron, following the method given by Dr. Eder for the preparation of his ferrous oxalate developer. He carried out the development in the same way as is done by the oxalate, and he found that the succinate of iron is even more energetic than the oxalate. The plate develops regularly with much delicacy, and gives a peculiar tone. It is necessary to take some fresh solution at every operation, on account of the proto-succinate of iron being rapidly converted into per-succinate by contact with the air.

Method of Making Friable Hydro-Cellulose.—At the meeting of the Photographic Society of France, M. Girard showed his method of preparing cellulose in a state of powder, specially adapted for the production of pyroxyline for making collodion. Carded cotton-wool is placed in water, acidulated with 3 per cent. of sulphuric or nitric acid, and is left there from five to fifteen seconds; it is then taken out and laid on a linen cloth, which is then wrung so as to extract most of the liquid. In this condition there still remains from 30 to 40 per cent. of acidulated water; the cotton is divided into parcels and allowed to dry in the open air until it feels dry to the touch, though in this condition it still contains 20 per cent. of water. It is next enclosed in a covered jar, which is heated to a temperature of 65°C.; the desiccation therefore takes place in a closed space, and the conversion of the material is completed in about two or three hours. In this way a very perfect hydro-cellulose is obtained, and in the best form for producing excellent pyroxiline.

Correspondence.

HYPOSULPHITE IN THE OXALATE DEVELOPER.

Dear Sir,—Allow me to express my best thanks to Captain Abney for his communication about the addition of a few drops of weak hyposulphite solution to the iron developer, which, I consider, simply invaluable. As a rule, I take 4 or 5 drops hyposulphite (1 in 200) to 4 or 5 ounces iron; but then I only work landscapes, with plates prepared by myself. The great advantages are, first, a perfect freedom from halation. The negatives do not get over-developed, even with strong contrasts in the lighting; and, consequently, it is not necessary to back the plates with asphaltum, which is apt to get loose under the development, the small scales spoiling, more or less, the negatives, by settling on the films, and occasioning smaller or greater (undeveloped) holes in the film. Finally, I can now give full exposure for the shaded parts without fear of having the lights too strong, which was generally the case with the original iron developer.

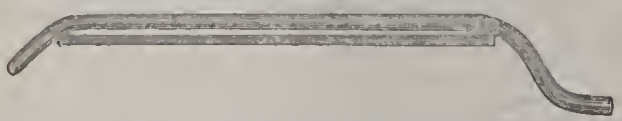
In conclusion, I beg to remark that M. Fabre, of Toulouse, has observed that, in order to get the full effect from the hyposulphite, the oxalate developer should be acid, and that otherwise the effect will be bad. I found this to be very true, and now I test the developer after the addition of the iron; finding it neutral, I add a few drops of oxalic acid in water, till blue litmus paper turns slightly red in the solution.—Very truly yours,

A. L. S. Haakman.

COATING GELATINE PLATES.

Dear Sir,—The following dodge, simple and useful, I send for amateurs who coat their own plates.

Take a glass rod, and over a lamp bend it at both ends the width of the plate, leaving the middle part straight. A gap will remain between the rod and the plate. Pour the emulsion on to the plate, and pass the rod through the fluid; run it along from end to end, tilting the plate to make the emulsion follow.—Yours faithfully,



F. Dawson, C.B., Colonel.

A PLEA FOR WET PLATES.

Dear Sir,—I think that if the writer signing himself "Nitrate Bath" to a letter published in your last issue on the above subject would learn to work wet plates properly before he attempts to it give advice to others, would be well. I do not call it careful working to work with the dark room door wide open. I have occasionally seen slovenly workers work in this way. I have never seen good work done in the kind of dark-room your correspondent says he works in. Again, I am at a loss to know what he means by blurring in the shadows; and about dry plates he says something to the effect that a dry-plate worker has to work in a room dark as pitch, and *without ventilation*. Here, again, he shows his ignorance of the subject he is writing about, and I must flatly contradict him. In the dark-room one can have as much ventilation as he likes, providing all white light is kept out. Again, if you are working with gelatine plates, and your negative does not please you, you can soak it off and coat it again.

I do not see what your correspondent has to complain of in the price charged for plates, but I suppose he is like many other photographers: he expects to pay about one penny for (say) a quarter-plate to take a carte portrait, and charge (say) ten shillings and sixpence per dozen for his productions; but some people will grumble.—I am, dear sir, yours, &c., An Old Hand.

Proceedings of Societies.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting was held at the Museum, Queen's Road, on Wednesday evening, the 4th inst., Mr. T. Davey, vice-president, in the chair. The minutes of the previous meeting having been passed,

The Hon. Secretary stated that, in accordance with Rule No. 1 of the Competition regulations, the four titles of the subjects would be decided upon. The judges had each handed in four titles; these had been written upon slips of paper which were folded up, and would be drawn from a box, the first four drawn being those which were decided upon.

The Rules for the award of four bronze medals for photographic pictures may be briefly enumerated as follows:—

Competing pictures to be sent to the hon. sec. not later than October 15; pictures to be not less than "half-plate," only two studies for one title being admissible. No enlargements are permitted, and the pictures must be entirely the work of the competitor. At the back of each picture must be a *nom de plume*, and it must be behind a plain cut-out mount of a colour approved by the Society. Only rolling permitted; no enamelling or burnishing. The medals are to be of bronze, and no competitor can receive more than one. The decision of the judges (Messrs. H. Whatley, W. Harvey Barton, and W. H. Midwinter) to be final; it will be made known, and the pictures exhibited in November. If there are less than four competitors there will be no award. "Artistic treatment" and "high technical excellence," "combined with original and pure conception," to be the basis of judgment.

The four titles of subjects chosen are—

Figure Studies (*Genre*).—1. "The Children's Hour."

Between the dark and the daylight,
When the night is beginning to lower,
Comes a pause in the day's occupations,
That is known as the children's hour.—*Longfellow.*

2. "Cinderella."

Landscape Studies.—3. "Autumn."

Sweet Sabbath of the year,
While evening lights decay,
Thy parting steps methinks I hear
Steal from the world away.
Amid thy silent bowers
'Tis sad but sweet to dwell,
Where falling leaves and drooping flowers
Around me breathe farewell.—*Montgomery.*

4. "The Meadow."

The Hon. Secretary then brought forward the subject of the June out-door meeting.

The following places were suggested:—Tintern, Stourton, Glastonbury, Cheddar, &c.

After considerable discussion, Tintern was fixed upon, for although visited by the Association many times before, none of the members present considered they had exhausted it, and being a very favourite place it was considered desirable to open the excursion season with it. Arrangements were also made for obtaining information as to Stourton and Glastonbury (Abbey).

After some little discussion on other topics, the meeting was adjourned.

Glasgow Photographic Society.

Replies to Questions by Mr. Warner, Bristol, as to Mounting of Photographs on Glass.

1. "Should photographs mounted on glass so as to retain all the beauty and delicacy of a print fresh from the washing trough be admissible in an exhibition where all the other competitors mounted on boards?"

2. "Would they be eligible for a medal at such an exhibition?"

Answer.—The two questions are really only one; for by the terms of the first question, it is evident that the point is not whether prints so mounted shall be allowed to be *exhibited*, but whether they shall be allowed to "*compete*" *for prizes* with those mounted on boards. Unless they are *expressly excluded* from competition under the conditions of the exhibition, *it is right* that they should be allowed to compete; *because*, it is thus open to every exhibitor to choose his own style of mounting; and those who adopt card or board mounts, therefore, do so, it may be presumed, because they consider that style of mounting is best suited to show their prints to advantage, just as those who mount upon *glass* prefer *that* style for theirs. It is therefore entirely a matter of taste on the part of the competitor, and neither party is entitled to say that the other is taking an advantage of him. It is a matter entirely for the judges to decide which print is entitled to the award, the exhibitor having deliberately chosen the style of mount which he thinks best fitted to show it to advantage. This seems the proper answer to Mr. Warnor's first communication (of 8th March). In his second (April 13th), in which he comments on this answer as, substantially, it appeared in the journals, he says, referring to glass mounts: "It does not savour of art, this shiny surface." It appears, therefore, that in his opinion a *board* mount is *best*, and most artistic, and the mounter on glass does *himself* an injustice, in Mr. Warnor's opinion, and not his competitor, for the judges are supposed to be men who will take the *artistic* merits of the print into consideration in giving their award. In Mr. Warners, aforesaid second communication, he introduces other matter entirely, which was not before our Society when considering his questions. He says: "The picture so mounted 'on glass' may be painted on from the back, and expression given to the high lights which does not really exist, and so convey a semblance of beauty and modelling which the subject does not possess. For instance, a very thin negative printed on highly albumenized paper may be treated thus—a bridge and water, and a transparency and depth given to the water which is not on the negative, and possibly never in the original." *This* is altogether a different matter from mounting. But does Mr. Warner mean that prints for competition should be *wholly untouched?* Unless he does, why does he object to retouching or "modelling" from *behind*, any more than from the front? There seems *no difference whatever* in principle; and if the one should disqualify for competition, so should the other. My own opinion is, *no retouching of any kind* should be allowed in competing prints, but that they should just be as they come from the printing frame, with no further improvement than what results from toning, fixing, and mounting, and that therefore glass-mounted prints treated as Mr. Warner indicates by touching from behind *should be disqualified for competition*, but just as much as, and no more than, prints touched on the front, as in both cases "an expression is given to the high lights which does not really exist, and so a semblance of beauty and modelling is conveyed which the subject does not possess;" "a transparency and depth which is not in the negative, and possibly never in the original."

3. Mr. Warnor's first communication, and more fully commented on in his second, the Society did not reply to. It referred to an alleged practice of some photographers—not a common one, it is to be hoped—of exhibiting *sample* prints mounted on glass *from which to take orders*, and delivering the orders so taken *mounted on boards*, without informing the party placing the order, of the difference he might expect between the sample submitted, and the prints he would receive in execution of the order. Such conduct is so manifestly unfair as to warrant the severest censure, and Mr. Warner's condemnation of it is thoroughly merited. It is fitted to bring photographers and photography into disrepute, and it would be well if all who are imposed upon by such unfair dealing would prosecute the offenders, and make them feel in their pockets, if not in their consciences, that the offence is not only against the public, but against their profession and themselves.

(Signed) John Parker.

Newcastle-on-Tyne and the Northern Counties' Photographic Association.

The ordinary monthly meeting was held in the College of Physical Science, on Tuesday, the 10th instant, at 7·30 p.m., Professor Friere-Marreco, M.A., vice-president, in the chair.

Messrs. R. T. Ward, W. McLeish, Robt. Patterson, J. F. Malings, C. S. Lindsay, and Dr. Stainthorpe were duly elected members. Mr. J. W. Robson was proposed for election at the next meeting. The Hon. Secretary read the following letter:—

Shotton Vicarage, April 18th, 1881.

Dear Sir,—I thank you very much for electing me an honorary member of your Photographic Association, and am only sorry that, in consequence of ill-health, I shall be prevented from taking an active part in your proceedings. If, however, I should notice anything worth recording, you may rely upon my sending it to you. Wishing you every success in your endeavours to improve the art.—Believe me to be, yours faithfully,

(Signed) T. Frederick Hardwich.

The Chairman said there were two questions to be put before the Society. The first was: In photographing an interior, when the lens is turned to the source of light, what is the best way to get quit of halation?

Mr. P. M. Laws referred to taking the interior of a building, and said the first negative gave a serious amount of halation; and, seeing that it would be fatal to the picture, he suspended sheets of canvas over three windows facing the lens In that particular instance halation was effectually overcome by that method. In taking the interior of a church, where it would have been almost impossible to have suspended canvas, it struck him that a coating of whiting, with a little colouring matter, would be another means of overcoming the difficulty. With wet plates he had never experienced so much difficulty; but with dry plates the halation was so enormous that some means must be adopted to overcome it. The room in which he tried his first experiment would be about fifteen feet long, and the windows were stained glass. The second place was a hundred feet long. His first experiment produced no effect; but, after making the alterations he referred to, he succeeded in securing a beautiful effect, and the stained glass was quite clearly shown.

The Chairman said he thought the thanks of the Society were due to Mr. Laws for the explanation of his endeavour to overcome the difficulty, and in the meantime it would be as well for other gentlemen to try experiments in that direction.

The next question sent up was as follows:—"Is the platinotype permanent."

There was no response to the question.

The Chairman then said that he could hardly give an opinion except on purely theoretical grounds. With regard to the chemicals employed, there appeared to be no reason why platinotype printing should not be the most permanent in use. There had been no time as yet to speak practically on the question, as platinotype had only been in use during the last two years; in fact, the latest formula for platinotype had only been in use a short time.

Dr. Berwick, of Sunderland, then read a paper on "Micro-photography," with practical illustrations [in our next]. He said he would endeavour to explain to them the taking of photographs by means of the microscope as he had hitherto practised it. He had not had much experience, but he would give them the results of that experience, such as it was.

The simplicity of micro-photography by an ordinary camera and an ordinary microscope appeared to excite the greatest interest among the members present. Dr. Berwick, having placed the microscope in position and adjusted the focus, took a good picure of trichinosis. Dr. Berwick also presented several specimens of the results of micro-photography to the members, and, being the first presentation of the kind, were thankfully received. He also remarked that the microscope was one of Messrs. Smith and Beek's, and was especially valuable for that kind of work.

On the motion of Mr. Laws a hearty vote of thanks was awarded to Dr. Berwick.

A short conversation then ensued amongst the members as to the desirability of having a portfolio or an album to hold the photographs presented to the Society. Ultimately it was agreed that the Hon. Secretary (Mr. J. B. Payne) should be authorised to purchase a portfolio and scrap album for the preservation of such photographs as readers and members might think fit to send to the Society.

The proceedings then terminated.

The outdoor excursions are:—June 28, Hamsterley Park July 2, Morpeth; August (bank holiday), Hexham; September, Marsden.

Talk in the Studio.

Photographic Society of Great Britain.—The first of the informal meetings of this Society, to be known as "Technical Meetings," will take place on Tuesday evening next, May 24th, at the Gallery, 5a, Pall Mall East. The chair will be taken at 7.30; tea and coffee (provided) at 8.30; and the proceedings to close at 9.30. A "Question Box" will be introduced, and members (especially those in the country) are invited to send questions to be discussed.

Mr. Henderson's Thursday Evenings for Photographers.—Yesterday week Mr. Henderson demonstrated his method of preparing gelatino-bromide emulsion. A solution of 200 grains of silver nitrate in 3½ ounces of water is treated with enough ammonia to redissolve the precipitate first formed, about 2½ drams being required for this purpose. The solution of ammonia nitrate of silver thus obtained is next heated to about 100° F., when the following solution, also similarly heated, is allowed to flow into it in a slow stream; the mixture being agitated with a glass rod meanwhile. Gelatine ½ ounce, ammonium bromide 150 grains, water 4 ounces, ammonia 2 drops. The mixture being now allowed to set, is forced through a wire gauze disc, having ten meshes to a linear inch, and washed by means of a stream of water; a period of from four to twelve hours serving for the purpose. The emulsion being then melted is found to possess the greyish blue tint which is characteristic of great sensitiveness, and yet the grain is extremely fine. To make dry pellicle the emulsion is poured into about three times its volume of methylated alcohol, and the clot is well worked with the hand to allow the bulk of the water to diffuse out into the spirit, after which it may be readily and rapidly dried.

The West Kent Microscopical Natural History and Photographic Society held their annual *soiree* at the Mission Schools, Blackheath, on Wednesday last, May 11th. The company was brilliant and numerous, and the various objects exhibited elicited much favourable comment. Messrs. Morgan and Co. exhibited many very fine specimens of their new enlarging process, and also gave a demonstration of it before the audience.

Eye Photographs.—After the so-called "visual purple" was discovered by Professor Boll, and it was found possible to produce pictures on the retina, which might be examined after the animal's death, the possibility of obtaining such pictures depicting murders, &c., was discussed. In a recent article in the New York *Medical Journal*, Dr. Ayres, who made over a thousand experiments in taking "optograms" on the retina of animals in Professor Kühne's laboratory at Heidelberg, comes to a negative conclusion on the point. While working in the laboratory, Professor Kühne proposed that he should make a picture of Helmholtz, and send it to the latter in acknowledgment of the value of his researches on physiological optics. Dr. Ayres, therefore, got a large negative of Helmholtz, and placed it over the eye of an animal which had been dosed with atropine. The animal had been in the dark room for hours. The sun was shining brightly, and, every precaution having been taken, the retina was exposed for four minutes. There was a dull picture on the cornea, and when the retina was examined, there was found an image of Helmholtz's shirt-collar and of the end of his nose. The light transmitted through the negative was not sufficient to bleach the visual purple. As the purple is rapidly regenerated in the living retina, and may have been restored in this case as fast as it was bleached, Dr. Ayres cut off the head of a rabbit, and waited till all such power in the retina was certainly done away with. Then he repeated the experiment. The result was a little better, but the optogram was by no means distinct enough for one to recognise even that it was intended for a picture. Dr. Ayres therefore concluded that an optogram could not be so obtained. He believes it utterly idle to look for the picture of a man's face, or of the surroundings, on the retina of a person who has met with a sudden death, even amid the most favourable circumstances.

Society of Arts.—*Applied Chemistry and Physics Section.*—On Thursday evening, May 26th, a paper on "Telegraphic Photography" will be read by Mr. Shelford Bidwell. The chair will be taken at eight o'clock by Mr. W. H. Preece.

The Actinic Balance.—Mr. Langley, of Allagheny Observatory, has devised an instrument for measuring radiant energy, which, for sensitiveness and rapidity of response, far exceeds the thermopile and galvanometer of Melloni. The current from a small battery is divided between two circuits of equal resistance, each circuit including a galvanometer coil, these coils being so placed as to exercise contrary deflective tendencies on an astatic needle; which needle consequently remains at rest. If any portion of one circuit is heated, its resistance to the electric current is increased, and the balance of power is overthrown, so the needle deflects. That portion of the circuit which is adapted to receive the radiant heat which is to be measured is very delicately constructed, and consists of two strips of half an inch long, $\frac{1}{20}$ of an inch wide, and $\frac{1}{12000}$ of an inch thick. The heat of the moon deflects the needle of Mr Langley's "Actinic Balance" readily, and he finds that the maximum heat point of the spectrum is not to be found in the ultra red, but in the orange. Moreover, the course of heat approximately corresponds with the course of light.

Radiology.—A new science, which may perhaps be called "Radiology," appears to be gradually coming into existence, one of the latest outcomes of this branch of study being the fact that all forms of matter yield sound when exposed to an intermittent beam of light, each flash no doubt producing a change in form or magnitude; lamp black is especially sensitive in this respect. It also appears that by an arrangement called a spectrophone the invisible lines of the spectrum may be recognised by the ear, and this instrument may prove a valuable adjunct to the camera in exploring the ultra-red portions of the spectrum.

To Correspondents.

Know Nothing.—As regards the process for carbon pictures on opal which we before recommended you to try, you will find a valuable paper on page 172 of the Year-Book. If, however, you prefer the collodion process, you will find all information on page 62. The latter method of working will perhaps suit you best, as involving less novelty of manipulation to you.

Giappei.—The mischief is due to frilling or a blistering up of the gelatine film, and this may arise from contact with warm hands, the use of solutions which are not sufficiently cold, or from the circumstance of soft water (rain water) being employed in making up the developing solutions. In the majority of cases, it is sufficient to add a small proportion of Epsom salts (magnesium sulphate) to the water employed for making the developers and washing the plates. One part of the Epsom salts to 2,000 parts of water will generally be found sufficient, but twice this quantity will do no harm. If this fails to prevent the frilling, soak each plate in a saturated solution of alum after development, and before fixing, and rinse slightly before placing in the hyposulphite bath. Plates which frill in spite of this, may be treated with the alum solution before development, and a small proportion of alum may be added to the water used for washing. Should you meet with any further difficulties, we shall be pleased to give you any information in our power.

F. M. S.—The defects you refer to are very annoying, and no doubt have sorely tried the tempers of most of us. The best way is to return any defective packages, as under these circumstances the manufacturer can generally trace the mischief to the right party. We have found Nos. 8 and 9 as uniformly coated as any which we have tried.

A. H.—1 and 2. An ordinary negative collodion iodised with only two-thirds of the usual proportion of iodizer, and the following developer:—

	Pyrogallic	30 grains
	Citric acid	10 ,,
	Tartaric acid	5 ,,
	Glacial acetic acid	1 dram
	Water	10 ounces
3.	Mastic	40 grains
	Sandarac	160 ,,
	Ether	4 ounces
	Benzole	3 ,,

See the Year-Book for further information.

R. Parr.—Speaking generally, we really have no choice between No. 1 and No 2. Each works well with an aperture of $\frac{f}{9}$ to $\frac{f}{12}$ but there is no question that one may occasionally meet with a lens of either class, which, as regards definition, is above the average. Neither of the makers named would hesitate to change any lens which failed to give perfect satisfaction. Should you require anything quicker than the lenses named, you cannot do better than obtain a rapid portrait lens by either maker. Except in extremely rare cases, we should not recommend the baby lens, as the limit of sharp definition is very small indeed when the full aperture is used; and if you stop down, the instrument has no advantage over the usual rapid lenses.

Gold.—1. Three parts of hydrochloric acid, and one part of nitric acid. When the metal is dissolved, evaporate to dryness over a water bath, and after all the excess of acid is gone, add sufficient water to make a solution which shall contain half a grain of gold to each dram. 2. You had better fuse it with a little carbonate of soda before dissolving it. The kind of furnace described on p. 170 of the present volume well answer your purpose very well.

R. Gordon.—It is much better to enlarge by daylight, it being merely necessary to allow the light from the sky to shine through the negative, a large mirror being used to direct the light in a horizontal direction if this is considered advisable, and to form the enlarged image by means of a portrait or doublet lens. The method you enquire about is well adapted for landscape enlargements, and we have seen good work in this direction.

Briton.—The best thing you can do is to reduce the whole to the state of metallic silver by one of the usual methods.

Spots.—1. It is probable that you may emulsify with too small a proportion of gelatine. 2. One frequent and unnoticed cause is the use of vessels of porous earthenware into which old emulsion has soaked.

B. S.—In order to prevent any possible difficulty or misunderstanding, we would advise you to print the word on each.

W. B. Holland.—Under the circumstances we should be inclined to think that your employer ought to bear the loss; but as we do not know all the circumstances, our opinion may be of little value.

Globe Lens.—Under certain conditions of lighting there is great liability to flare-spots, and, under any circumstances, there is a deficiency of light near the edges of the field.

Red Dye.—All those you mention are fugitive—prolonged exposure to light serving to bleach them. Alizarine lake is one of the most suitable.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1186.—*May* 27, 1881.

COMMISSIONERS OF PATENTS

CONTENTS.

PAGE
New Formulæ for Collotype Printing ... 241
The Influence of Light on Animal Life ... 241
Christian's Copying Process ... 242
Photography In and Out of the Studio ... 242
By-the-Bye. The Publication of Photographs ... 243
Tissue Negatives from Gelatine Plates. By Wilfred Bailey ... 244
Micro-Photography. By George Berwick, M.D. ... 245
Notes ... 246
Topics of the Day—Lens, or no Lens? By John Spiller, F.C.S. 247

PAGE
Reviews ... 247
On the Use and Abuse of Accessories. By S. Bottone ... 247
New Discovery Regarding Gelatine Emulsion. By L. Warnerke ... 248
Reduction of Over-Printed Proofs. By W. England ... 250
Correspondence ... 250
Proceedings of Societies ... 251
Talk in the Studio ... 252
To Correspondents ... 252

NEW FORMULÆ FOR COLLOTYPIC PRINTING.

The successful working of the collotypic printing process depends rather on an intelligent comprehension of the numerous conditions which must be fulfilled, than on absolute adhesion to any sharply-defined set of formulae; but the following, taken from a German source, will, we believe, form a good basis for every-day work.

The glass plates, either polished or ground, having been very thoroughly cleaned by means of tripoli and ammonia, are first coated with a filtered mixture of 1 part of potash water-glass and 11 parts of strong ale, and after the excess of this has been allowed to flow off, the plates are slightly warmed, and allowed to remain at rest for at least twelve hours. At the end of this time the plates are once more gently warmed, and then well rinsed in cold water, dried, and again warmed. All is now ready for the application of the second coating, which is prepared as follows. Twenty-five parts of a suitable gelatine are thoroughly softened in cold water, this being changed once or twice in order to remove any traces of soluble saline matter, and the softened gelatine is next dissolved in 200 parts of water to which $\frac{3}{4}$ of a part of chrome alum has been added. A temperature of about 50° Centigrade is required for the solution of the gelatine, and when the whole is perfectly dissolved, $2\frac{1}{2}$ parts of potassium bichromate and $2\frac{1}{2}$ parts of ammonium-bichromate are added: these salts being finely powdered, and the preparation stirred until solution is complete. A careful filtration is of course necessary, and the coated plates should be dried at a temperature of 50° Centigrade. After exposure and soaking in cold water, in order to remove any unaltered chromium compounds, the plates are allowed to dry spontaneously. The surface is next thoroughly moistened with a softening fluid prepared by dissolving 12 parts of hyposulphite of soda in a mixture of 500 parts of glycerine, 50 of ammonia, and 250 of water.

This softening fluid may also be used for moistening the film between the inkings; but its use will tend to give rather harder prints than would result from the employment of plain water.

As regards general directions for collotype printing, we may refer our readers to the Year-Book, and to articles which have appeared in the News from time to time; but some remarks as to the most suitable negatives for the work will not be out of place here.

It is of course understood that all negatives must be reversed, except in those rare cases in which a reversal of the print is of no importance; and when negatives are taken specially for collotypic work, the reversal is best effected by placing a silvered mirror or a reflecting prism in front of the lens. Mr. Warnerke's new method will also prove useful as yielding reversed negatives; and we have received from Mr. Pumphrey, of Birmingham, a pellicular negative taken on a new gelatino-bromide film which he has just introduced into the market. Although we have not yet had an opportunity of trying Mr. Pumphrey's sensitive films, we are much pleased with the appearance of the negative, no texture of the paper support being visible, and the film being sufficiently thin to allow of either side being printed from, so that the same original negative may serve either for collotypic or silver printing.

There can be no doubt that the collotype process is, under favourable circumstances, capable of perfectly reproducing, in a very fine stipple or grain, every degree of light and shade existing in the most vigorous and perfectly graduated negative; but, unfortunately, in order to attain such a perfect result, a very considerable number of conditions must be very perfectly fulfilled. The amount of bichromate in the film, the rate of drying, the time elapsing before exposure, the exposure, the degree of softening by water, the temperature at which the printing is performed, and the consistency of the ink, must be exactly balanced against each other, in order to build up the best possible result.

As a practical outcome of all this, it generally happens that the fainter degrees of half-tone are imperfectly reproduced in a collotypic print; or, if the inking is so forced as to bring them out, that the deeper shades are grey, and wanting in vigour. Now, the beauty of a portrait depends principally on the perfect rendering of these lower degrees of half-tone, and the consequence is, that portraits reproduced by the collotypic printing are generally less successful than some other classes of work. The best negatives to select for printing by collotype are those in which the least possible loss is incurred by any possible failure to thoroughly render the before-mentioned lighter shades of tone: and, for this reason, the most effective collotype prints are generally architectural or street views, interiors of a certain class, and photographs of mechanical appliances.

◆

THE INFLUENCE OF LIGHT ON ANIMAL LIFE.

The quality of light—that is, the comparative relation of the different coloured rays—seems to exercise a remarkable influence on living creatures. It seems, indeed, to be not unlikely that the sun's rays produce considerable effect on the development and health of animals, and even on the health of human beings, subject to the height above the sea level at which they live. We may take it as proved that various colours promote the increase of vital energy. At one time the idea that violet-coloured light can further animal development would do no more than raise a smile, but at the present day it must be accepted as a fact capable of visible demonstration. M. Emil Yung has made some experiments in the zoological laboratory of the University of Geneva, which, regarded as affording proof on this point, leave nothing to be desired.

Bérard, the naturalist, first promulgated the idea of placing the ova of flies under coloured glass. He found that the larvæ thus developed in a violet light were at least three times as long and as thick as those which had been kept in a green light. About ten years ago General Pleasanton, of Philadelphia, made some experiments with pigs. He placed four young pigs—one male and three females—in a stye covered with violet glass, and four others in a stye roofed with white glass. The first of these—those in the violet light—weighed at first 122 lbs., and at the end of four months they weighed 520 lbs.; the other lot, which had been kept in white light, weighed at first 144 lbs., and at the end of the same time they turned the scale at 530 lbs. Hence it appears that the animals living in the violet light increased 398 lbs. in weight, while the others increased only 386 lbs.

In his recent experiments, Emil Yung decided not to use coloured glass, which it is very difficult to get monochromatic in any quantity, but to have recourse to coloured liquids. He commenced his operations with aquatic animals, taking special care that the conditions of nutrition should be as nearly the same as possible in all cases. In this way he studied the growth of tadpoles, trout, cuttlefish, salmon, &c. Those animals which he kept in the violet and blue vessels he found increased in size very rapidly; those, on the other hand, in the red and green vessels grew very little. The tadpoles of *Rana esculenta* had grown in the course of a month to the following extent:—

In the	red	vessel	19·16	millimet.	in length	4·50	in breadth.
,,	yellow	,,	22·50	,,	,,	5·33	,,
,,	green	,,	15·16	,,	,,	3·66	,,
,,	blue	,,	24·50	,,	,,	5·66	,,
,,	violet	,,	27·50	,,	,,	6·66	,,
,,	white	,,	23·10	,,	,,	5·50	,,
,,	dark	,,	19·66	,,	,,	4·66	,,

It was thus seen that the maximum development took place in the violet, and the minimum in the green light; in the dark the animals certainly grew, but only slowly, and very much the same as in the red light.

These results of Yung's have been corroborated by Serrano Fatigati, who in the year 1879 experimented in the same way with infusoria, and found that the violet light promoted the development of these lower organisms, but that the green light retarded it. Violet light appears, also, to promote decomposition, and to stimulate the respiratory functions. If tadpoles are kept without food they die sooner under the violet light than under the white light. Animals, therefore, behave under the influence of light quite differently from plants; darkness kills the plant, but does not prevent the animal from growing.

To sum up, it appears to be now proved (notwithstanding a few experiments to the contrary) that violet light is favourable to animal life, and that red light is specially advantageous to vegetable life, but that green light is injurious both to animals and plants.

The question is, how does the light act on the subject submitted to its influence? Does it act through the organs of sight? Moleschott showed some time ago that the eye possesses some influence, and that blind frogs expire less carbonic acid than those who can see. But there seems to be no doubt that the skin, also, is stimulated, and that, probably, in a twofold manner; in fact, that light acts on the nervous system in every possible way. By any other theory it is impossible to explain the phenomena of respiration and nutrition in animals exposed to various coloured light.

CHRISTIAN'S COPYING PROCESS.

In our French Correspondence of the 22nd October last year, mention is made of a circular issued by M. Christian, of Paris, notifying the discovery of a new process for printing on paper, by means of which at least 300 prints can be taken in the course of an hour; the exposure by the light of a gas burner, or of a paraffin lamp, was stated to last for a few seconds only, and the copies were warranted to withstand the effects of light, water, or the atmosphere. The printed images are said to consist of metallic oxides, and to be coated with some air-proof substance. This invention has been patented in several countries, and the patent rights are offered for some hundreds of francs.

The mystery with which the inventor sought to invest his process has now been cleared up by Dr. Eder. According to this distinguished analyst, M. Christian's prints possess great brilliancy, and their surface is not acted on by water—hot or cold—by alcohol, by chloroform, or by oil of turpentine; but ether, or ether-alcohol, temporarily destroys the brilliancy. By boiling in water the coating swells up, and a thin film of collodion is detached; the same effect is produced very quickly by means of dilute acids or alkalies

A further investigation showed that the image contains silver in no small quantity; it is taken on a layer of gelatine which has been tanned with chrome-alum, and afterwards it has been coated with collodion, which both heightens the lustre and acts as a preservative. Most probably the prints are first secured on a gelatine emulsion containing salts of silver, and are then developed; but what silver salts are used, the analyst was unable to discover. He was also unable to say to what substance the prints owed their pleasing brown tone; the tests for platinum and gold gave negative results, but the minuteness of the quantities of the substance which could be submitted to analysis rendered the results uncertain.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Action of Various Developers on Modern Dry Plates—The Scientific Principles of Bromide of Silver Photography—Collodion *v.* Gelatine—Dynamo-Electrical Machines Driven by Hand—New Photographic Gelatine—Removing Fog from Gelatine Plates.

Action of Various Developers on Modern Dry-plates.—Some weeks ago we referred to the curious observation of Dr. Vogel regarding the action of the ordinary acid developer (pyrogallic acid, citric acid, and silver) on highly-sensitive emulsion plates. According to this investigator the acid developer acts imperfectly on these plates and on ordinary collodio-emulsion films of the best quality: and if we had not had the alkaline developer, nobody would have found the modern emulsion plates in any way superior to wet plates. Dr. Vogel suggested that, perhaps, the greenish silver bromide is more easily reduced after being affected by light than the nearly white silver bromide. As we now see, he has made further experiments in this direction, by which he proves that, contrary to his suggestion, the greenish bromide of silver of the gelatine plates is not more easily reduced, but is more difficult to reduce by, the alkaline developer than the white silver bromide. In general, all alkaline dry-plate developers for the modern plates are very strong—stronger, indeed, than alkaline developers generally employed in the case of collodion emulsions. Now, Dr. Vogel tried collodion emulsion plates and gelatine collodion emulsion plates simultaneously exposed, and employed a weak developer such as is generally used with collodion emulsions, viz:—

2,8	cub. cents.	Carbonate of ammonia solution (1:4).
1,6	,,	Bromide of potassium solution (1:4).
0,5	,,	Pyrogallic solution (1:10).
60	,,	Water

The result was that the *collodion* plate developed much quicker than the other; but the development stopped as soon as the high-lights had appeared. Later on the corresponding parts of the other plate came out, the collodion plates beginning to fog at the same time. The results of the experiments were the same as if the collodion plates had been covered with a solution of gelatine in acetic acid and dried, and this coating prevents fogging perfectly. We must, therefore, conclude that the white bromide of the ordinary collodion emulsion is more easily reduced by the alkaline developer than the green bromide of silver of the modern emulsion plates. Anybody would assume that the form most readily reduced by chemicals must also be easier to reduce by light; but we see that this is not the case.

The Scientific Principles of Bromide of Silver Photography.—There are theories bearing on this subject by Abney, Eder, Monckhoven, and others; but how far are they in accordance with each other? Monckhoven refers to two different kinds of bromide of silver—the highly sensitive green bromide of the gelatine plates, and the less sensitive white bromide of the old collodion emulsion; but Stas, in his classical paper, published seven years ago in the proceedings of the Royal Belgian Academy, mentions six different kinds of bromide of silver. One of these modifications—the fused bromide—we can leave out of question; but there remain still five, which can be arranged in the following order:—1. The flocculent white bromide. 2. The flocculent yellow. 3. The powdery yellow. 4. The powdery white. 5. The granular whitish-yellow bromide. Stas says that the granular whitish-yellow bromide becomes intense yellow by the action of bromide of potassium, and that the bromide in this form is so sensitive that it is blackened in two seconds by the light of an ordinary Bunsen burner. It is probable that this granular bromide of Stas is identical with the green bromide of Monckhoven. It must be remembered that capacity for blackening by exposure to light is in no measure of its sensitiveness when developed, as Monckhoven says, that the white bromide, which is less sensitive under development, is easily blackened by light, and that the highly sensitive green bromide blackens in light much more slowly. Another question arises: What is Monckhoven's white bromide of silver? Is it identical with the flocculent or with the powdery modification of Stas? Perhaps the learned author can give us an answer to this question.

Collodion v. Gelatine.—Dr. Schnauss publishes an interesting article on the future of the collodion process in comparison with gelatine. We reproduce the following remarks:—"Imagine that we should have only known the gelatine process up to the present time, and every photographer to be accustomed to buy the gelatine plates from manufacturers, or to prepare them himself. Some one suddenly invents a new process—the so-called collodion wet process—by which it is possible to prepare sensitive plates very easily in a few minutes; these plates develop and intensify very easily, drying in a short time, and being, moreover, cheaper than the old plates. Under these circumstances, everybody would praise the new invention as a great thing. 'Honour for all time to the excellent old collodion process!' exclaims Dr. Schnauss. It will continue to be honoured by being used."

Dynamo-Electrical Machines Driven by Hand.—We remember to have seen in the International Exhibition of 1862, an electric telegraph apparatus, in which the current was developed by a dynamo-electrical machine on Siemen's system. It was an apparatus very similar to a foot-lathe, being driven by a treadle. The electrical power so induced was sufficient for sending dispatches a distance of many miles. At the present time, similar electrical apparatus driven by hand are offered for photographic purposes in various continental papers. If the current of this machine is sufficient for giving a brilliant light, the introduction of electric light to all photographic studios would be only a question of time. More convenient for the purpose would be the carrying out of Siemen's idea, to produce (by water force, or in any other cheap fashion) electrical currents, these being conducted by cables passing along the streets to all establishments which want electric agency.

New Photographic Gelatine.—What is the best gelatine for emulsion work? There are a great many qualities of gelatine recommended for the purpose; one likes this, and another prefers that. The indefatigable Dr. Eder, after careful researches, recommends the gelatine of Simeons, in Winterthur, Switzerland; it is of very hard quality, and does not lose its coagulating power by long cooking. It is of acid reaction, contains about 16·3 per cent. of water and 1·62 per cent. of ash, and, moreover, Eder says, that a small quantity of this gelatine is sufficient for a larger quantity of emulsion than is the case with other samples; but, because it is hard, the plates develop more slowly. This can, however, be easily obviated by an addition of glycerine. The gelatine in question is also suitable for the ammonia process.

Removing Fog from Gelatine Plates.—The new means of removing fog from gelatine plates recommended by Eder is certainly a very interesting one, but it disappoints one a little to find that the plates cleaned in this way have lost much of their sensitiveness, they being not more sensitive than plates made from uncooked emulsion; and, on the other hand, it is a little inconvenient to wash each plate for some hours. We want a remedy for curing foggy emulsions without injuring their sensitiveness. Up to the present time we know only of iodine for this purpose, and we have cured emulsion by adding one drop of iodine solution in alcohol (½-gram iodine, 100 cubs. alcohol) to 20 cub. cents. of foggy emulsion, without injuring the sensitiveness to a noticeable extent, but a drop more of iodine solution reduced the sensitiveness considerably. In other cases we could add two or four drops of iodine solution before the fog disappeared, and sometimes we did not succeed at all with this remedy.

By-the-Bye.

THE PUBLICATION OF PHOTOGRAPHS.

The reason why pictorial photographs are so rarely produced is to be found in the difficulty of publishing them. There is plenty of talent among photographers now-a-days, but it cannot be turned to profitable account in this direction. The number of pictures exhibited during the year might readily be counted upon one's fingers; for photographers find that it is only in the production of carte or cabinet prints that any due return for their labours can be secured. If a photograph is not copied to these dimensions—and such small sizes are, of course, too circumscribed for ordinary pictorial effect—then the utmost difficulty is experienced in putting the work before the public. In the same way as an author does not write with a view to keeping his manuscript locked up in his desk, or a manufacturer produce articles for the mere pleasure of stocking his warehouse, so the photographer can scarcely be expected to set to work, unless some outlet for his talent is available. Even the salmon-legged mountebank, who does his posturing on a bit of carpet spread in the dirty road, refuses to go through the business of tumbling in a side street all to himself; he wants an audience of some sort, otherwise he puts on his long limp overcoat again, and goes off with his friend of the drum and fife to seek a better field for his talents. There must be a demand in the market, or else there will be no supply; and although supply often creates a demand, this is only the case when the supply is properly put before the public.

We have said that so far as cartes and cabinets are concerned, there is little difficulty about publication; but we do not mean to assert that we have attained perfection even in this respect. Photographs are a novel article of commerce, and it is at the fancy repository rather than among the goods of the *bonâ fide* print-seller that they are to be sought. In short, the prints that get into the market do so under the guise of knicknacks, and not as pictorial productions at all. Many of the cards possess high merit and, as we know, secure ready purchasers, but it is only because they are small and can be placed conveniently in the shop windows. Indeed, it will surprise many to hear what an enormous sale some of these little prints have. Rejlander's Ginx's Baby sold to the extent of five thousand copies within a twelvemonth of its publication. An edition of 20 000 of Mayall's carte of the Prince and Princess of Wales in their bridal attire was exhausted within a few months. Mr. Payne Jennings issued no less than 90,000 of his little summer sketches last year for Christmas and New Year's cards, and yet the demand was only half supplied. Mr. Frank M. Good's studies of flowers and plants are so popular that the negatives are steadily kept in the printing-frames; while, to take more recent examples, the Thames photographs of Mr. Mayland, startling with life and motion, and the delightful studies of swans by Messrs. Marsh Bros., have kept both firms in activity during the winter. A single negative of the Prince of Wales taken by Mr. Charles Watkins sold, as everybody knows, not long ago for £180, after some thousands of prints had been taken from it; and the Balmoral picture of Lord Beaconsfield, the statesman represented in his well known velvet jacket, is said to be as good as a small annuity to Messrs. W. and D. Downey.

We repeat, so far as small photographs are concerned, there is no lack of publicity, and consequently of sale; but with pictorial photographs, to use the term for work of larger dimensions, the encouragement given to the photographer is of the smallest. The pictorial effects of Mr. Robinson are purchased by painters and students, because this class of customers happen to know of Mr. Robinson's wonderful seas and skies, and use them as studies; but with the public generally, they command only a limited sale, for the simple reason that the public generally know nothing about them. There is an exhibition once a year in Pall Mall, where photographs may be seen, and where they are seen by some ten thousand visitors annually; but the time of holding it is in the autumn, when anybody who calls himself anybody is out of town, and when there remain but a couple of hours of daylight in the middle of the day fit for the examination of photographs. This last year, it is true, the West of England enjoyed an exhibition as well, where we had the pleasure of seeing for the first time two magnificent pictures of Bath and Bristol, measuring several feet across, by Harvey Barton—pictures it must have taken the best part of a summer to produce. It surely must be disheartening, after executing such triumphs of art as these pictures of Bath and Bristol undoubtedly are, to have no opportunity—save that of a photographic exhibition now and then—to show one's work. We do not ignore that there are photographic publishers both energetic and well conducted, but they are very few in number, and, as a consequence, unable to respond to the calls made upon them. A good engraving might be exhibited in a hundred shop windows in London to-morrow, and in every provincial town there would be repeated opportunities for showing it; but photographers, so far, have no such advantage, and the number of shop windows or galleries in which large prints are admitted do not amount to a dozen, probably, throughout London. And, unfortunately, the publishing trade being in so few hands, photographers, as a matter of course, have to put up with the disadvantages of limited competition.

Naturally, it is only a question of time. How long the present state of things will last is uncertain; it will depend upon the army of photographers itself in a measure, and upon the progress of photography in the direction of the fine arts. The Exhibition at Pall Mall only requires to be directed with energy and *savoir faire*, and to be thoroughly well advertised, to make it one of the most successful shows of London. The London Exhibition now pays for itself—in some years there has been a profit of fifty or sixty pounds—and, in the hands of a businesslike manager, it might be made still more lucrative. The Bristol Exhibition, we have been told, was twice as successful as that in London, so that the local Society must have netted a handsome balance. All this is in favour of photographers; for the more widely an exhibition is visited, the better are the productions known, and the greater is likely to be the demand for them. Mr. Slingsby's picture, "Alone," is, perhaps, the most successful pictorial photograph in the market, and, in this case, it was years before its sale commenced. Its first appearance was in the Exhibition at Pall Mall, where it was admired a good deal, and secured its author about a score of purchasers. Among the latter there might have been one or two persons interested in the sale of pictures; but "Alone" was never systematically pushed by a publisher, or, if it was, certainly without any marked result. For many months but very few copies of Mr. Slingsby's picture were sold; then it began to advertise itself on its sheer merits, and it was not, curiously enough, until three years after the picture had been exhibited that the sale became comparatively brisk. Last spring Mr. Slingsby had taken upwards of £500 for his picture, and, at this moment, the takings have probably increased by £200 more. Mr. Slingsby did his best to get his picture adequately published as soon as it was exhibited; in this he signally failed, and it was only after some disappointment that he found good fortune gradually smiling on him, and the picture surely and thoroughly doing its own work. Had the production, however, not entered the few favourable channels at first, Mr. Slingsby would have gained no more by his labours in this special instance than many of his brethren before and since. We do not mean to say there is no sale for pictorial photographs; we wish merely to emphasise the fact that their production pays inadequately by reason of the difficulty of publication. For this reason it is that photographers cannot afford to spend labour and pains upon the production of them. As soon as it is plain that good remuneration will follow good pictorial work, we may be sure our foremost photographers will not be wanting in their efforts to produce photographic pictures.

The "At Home" next week will be "At the Préfecture de la Police in Paris;" the following "By-the-Bye" will be "On Work and Wages."

TISSUE NEGATIVES FROM GELATINE PLATES.

BY WILFRED BAILEY.

The method of removing the films from collodion plates by means of a coating of transfer collodion, and subsequently either remounting them upon the glass in a reversed position to be utilised in processes requiring "reversed negatives," or preserving them as "tissue" negatives, in which form they may be printed from either side, will probably be familiar to most readers of the News. I am not aware, however, that any method has been made known for the application of the process to gelatine plates, which present somewhat more difficulty, so a few particulars of the treatment which I have found successful may not be unacceptable.

The collodion is prepared from one of the usual formulæ for the purpose, as follows:—

Ether	5 ounces
Alcohol, ·805	10 ,,
Castor oil	¼ ounce
Pyroxyline	¼ ,,

The gelatine negative (in a dry, and, of course, unvarnished condition) is flowed liberally with the collodion, levelled, and allowed to dry. The film is then cut through to the glass at a short distance from the edges, and the plate left to soak in water for some twenty-four hours, after which it will be found that the film may be lifted by a corner, and easily detached from the glass. It may then be reversed, and laid upon the glass under water, in a similar manner to that adopted with carbon tissue, the superfluous water being afterwards gently pressed out, care being taken not to injure the gelatine surface, which is somewhat tender at this stage. The plate should then be allowed to dry (not too quickly, or the film will have a tendency to peel off the glass). If only a reversed negative is wanted, it is now ready for use; but if a tissue negative is desired, the plate should again be flowed as before with the collodion, dried, cut round, either at the edges where previously cut, or to any size and shape desired, and then soaked in water until it can be easily removed from the glass, which will be the case in a few minutes. The film may then be dried in blotting-paper, and preserved between the leaves of a book (one interleaved with tissue paper will be found convenient for the purpose).

To print, the film may be laid upon a piece of glass in the printing-frame, and will be found to lay flat without difficulty in a dry state; but, if desired, it may be mounted as before with the aid of water, and dried. In the latter case, it will be generally found necessary to soak the plate a few minutes in water when the film is to be removed from the glass. In all stages of the process where soaking in water is required, be careful to continue it long enough, as if any adhesion exists between the film and the glass, damage to the former will ensue on attempting to remove it.

I was led to employ this method chiefly for the purpose of printing my negatives by the single transfer carbon process, which I consider the best and most convenient (for an amateur especially) that exists, but I find also great advantage in the small space occupied by the tissue negatives, and their portability. The tissue is very tough, and cannot easily be torn (unless a cut or tear has begun at the edges, in which case great care is requisite). The second coating of collodion acts as a protection to the enclosed gelatine film, and adds substance to the tissue, while it prevents the "cockling-up" which the sensitiveness of the gelatine to moisture causes if it is attempted to use the film as a tissue on its first removal from the glass, without a second application of the collodion as directed. Of course the same treatment may be applied to transparent positives, and might be useful for other purposes.

◆

MICRO-PHOTOGRAPHY.

BY GEORGE BERWICK, M.D.*

The meaning of the word "micro-photography," as usually understood, is a process of producing on glass or paper enlarged images of minute objects by means of the magnifying power of the microscope, contra-distinguished from another process, also called micro-photography, which diminishes large objects into photographic prints of nearly invisible dimensions. Those who are conversant with photographic enlarging will easily understand what I have to explain, because micro-photography and photographic enlarging are, as nearly as possible, identical operations.

The photographic artist, when he enlarges his pictures, uses a reflector to direct the light through the transparent negative, which is fixed upon a stage between the light and the lens. With the lens he focusses the object upon a ground glass or a movable screen, in the place of which he introduces a plate or paper photographically prepared to receive the enlarged image. In doing so he does much the same that is done when we take a micro-photograph. In like manner we use a reflector to throw the light through the microscopic object (the one belonging to the microscope answers very well, provided it be free from specks and scratches). For my own part I prefer to use a jet of gas light from one of Sugg's argand burners placed directly opposite the opening of the diaphragm behind the stage of the microscope, using a clear glass chimney, which gives a steady white light, while the object to be copied is firmly fixed upon the stage of the microscope in the usual manner, and all external vibration is guarded against, such as walking across the room, or the rattling of carts and carriages outside. It should be uniformly lighted—not too much so, causing indistinct definition; nor too faintly, to cause slow action. With a full jet of gas from a burner such as I have described, placed five or six inches from the object, using the quarter-inch diaphragm of the microscope, and the quarter-inch object glass, giving a focal range of eighteen or twenty inches (which you see is the full extent to which my folding camera expands), with an exposure of four to seven minutes, according to the opacity or transparency of the object, upon plates marked ten times quicker than collodion, good results are obtained, either with pyrogallic acid or ferrous oxalate developer.

I need not tell you that good or bad results will depend upon the nature of the transparency. If you have a badly-cut and ill-mounted specimen, bespattered with dust-spots and air-bells, you will get all these imperfections perfectly magnified; but if you are fortunate to possess a clean and uniformly-cut one, coloured not too red nor yellow, free from dust and air-bells, and mounted with glycerine instead of Canada balsam, you will no doubt succeed to your satisfaction.

The lens which I use is the ordinary quarter-inch object-glass belonging to the microscope, the principal feature of which is its small size and great convexity, upon which depend its greater magnifying power, and the necessity to bring it close to the object to be examined; no other lens is necessary. The eyepiece, with its lenses and the tube or body of the microscope, is for the time being laid aside, and, in order to secure a more perfect combination of camera and microscope, it is necessary to have an additional brass tube similar in size and length to the one in which the portrait lens is mounted, and, like it, provided with a screw-thread which will fit the flange of your camera. The other or front end of this tube is tapered forward like the nozzle of a syringe, on the end of which is also a screw to receive the object-lens of the microscope. This nozzle is made of a thickness to fit into the collar which projects from the stem of the microscope, to which it is made fast by a small screw passing through the collar into the tube.

When this connection is established, the camera and the tube covering the object-glass can be made to move backwards or forwards, approaching to or receding from the stage of the microscope, according as the rackwork adjustment is moved backwards or forwards, and by which means the object is focussed. On the upper and larger portion of the brass tube two slits or grooves are made—one to receive diaphragms of different sizes, in the same manner as with portrait lenses (those belonging to your portrait combination may be utilised for this purpose), the object of which is to regulate the size of the field of the picture, whereas the size of the object is determined by expanding or folding the camera—that is, moving the ground glass nearer to or farther from the lens. The second slit in the brass tube is placed about half-an-inch behind the other, and is intended to receive an imperforated diaphragm, which serves the part of a cap or shutter, because from the close proximity of the lens to the object under observation, when working with high powers, it is impossible to cover the lens with a cap or shutter in the usual manner.

This arrangement comprises all the apparatus necessary for the production of micro-photographs; and as for the subsequent manipulations of developing, fixing, and washing, these I need not explain, because they are matters with which you are well acquainted. I will, however, with your permission, say a few words on the mode of development which I have adopted, because from the limited experience I have had with gelatine dry plates I have come to the conclusion that the ferrous oxalate form of development is the best suited for this class of work.

With plates 4 by 5 in size I take an ounce and a-half of old ferrous oxalate developer (it matters not how old or dark it be, provided it be carefully filtered); this is passed over the plate and allowed to sweep backwards and forwards for two minutes, and then, whether the image appears faintly or does not appear at all, another ounce of newly-made ferrous oxalate solution is added to it. (The newly-made solution is got by mixing two drachms of saturated solution of sulphate of iron, to which no sulphuric acid nor bromid of potassium is added, with six drachms of saturated solution of neutral oxalate of potash.) When the newly-made solution is added to the old, the developing action is perceptibily quickened; but, what is of more importance, the action thus started acquires a progressive and continuous force, piling deposit upon deposit till the whole latent actinism employed on the film becomes thoroughly exhausted. I invariably carry on the development till the image is smothered out of sight on the front, and made to appear distinctly on the back of the plate.

---

* A communication to the Newcastle-on-Tyne and Northern Counties Photographic Association.

Notes.

The importance of publishing is not yet thoroughly understood by photographers generally. All honour to those who uphold the art aspect of photography, and strive for its advancement in this direction; but there is no reason why business should be neglected in the meantime. And there is no better plan, we feel convinced, to improve business, than keeping one's eyes open to the matter of publication. Fortunes that have been made in photography—and these are neither few nor small—have been for the most part the result of publishing, while the most eminent firms in London and Paris trace their greatness to this cause. The pains and labour spent upon some of the cabinet negatives, of which prints are before the public, are almost incredible, and yet it is money well invested. It is rare, too, that the most modest of provincial photographers does not get his chance to publish, only he fails to take it when it comes. There is no knowing when a negative may become valuable, but even when this does happen, few are alive to spending the necessary money and trouble to bring it—and their name as well—prominently before the public.

An example has just reached us. Some years ago a young gentleman, a lieutenant in the army, was photographed in a country town. Although it was but an ordinary negative, one might have expected that ordinary care would have been taken of it. One day—it is not so long ago—the lieutenant became famous, and his name was in everybody's mouth; he was thousands of miles from home, and the value of the negative would have increased a hundred-fold if it could have been found for publication, for that young officer received the Victoria Cross, and is now a major in the army.

In a word, good photography alone is not likely to make one's fortune; business tact and experience are as necessary to a photographer as to a merchant. Art knowledge and technical skill represent the photographer's capital, and capital without experience is of small account. Nay of the two commodities, a business knowledge is the more valuable. It is always well to bear in mind what a cynical partner once said: "At the present moment, my colleague has the capital and I have the experience; in a little while I shall have the capital and he will have the experience."

The fact that an ordinary gelatino-bromide negative image is always accompanied by a positive picture, this latter existing on the unexposed side of the film, was announced and commented on by us in two leaders which appeared in the News during December last.

The Royal Academy has now recognised the circumstance that high art may take the form of a wood-engraving; the first picture of this kind considered worthy of exhibition having been accepted this year. Who can tell whether the time may not arrive when the Academicians will admit the possibility of artistic merit in a photograph?

Is it true that one of Mr. Vernon Heath's Burnham beeches has been blown down, or is it one of the less significant trees which has fallen?

The other day a correspondent alluded in these columns to "the poor photographer." We know of one "poor photographer" who, within the past eight years, has sold 200,000 portraits of Lord Beaconsfield.

It seems to be an easier matter to import photographs into this country than to export them. During the past month pirated copies from home photographs have been introduced into Great Britain by thousands from Germany, for the most part of the above popular statesman, and sold upon barrows in the streets at a penny a-piece. Not only, therefore, is it necessary for portraitists in this country to register their pictures, but it will also be requisite for them to combine to protect the copyright, if they wish to enjoy the fruits of their work.

As to exportation, we heard of a British firm who sent 6,000 copies of Mlle. Sarah Bernhardt's portrait to the United States. Not only was there a duty of twenty-five per cent. charged upon the pictures, but more than a fortnight's delay was caused in conforming to certain regulations, a period sufficient to jeopardise the whole undertaking; for by that time the States were filled with spurious copies of the very pictures that were denied an entrance by the Customs.

An inventor perseveringly advertises the plans of a "self-moving wheel by gravity," the price being £25,000. Could he not include a small working model for this price?

Negatives that are to be stripped from the plate, or collodio-chloride positives required to be detached from glass, are best prepared, says Herr A. Franz, in the *Correspondenz*, by using a three or five per. cent solution of india-rubber in benzole, which is applied before the collodion or gelatine. This substratum makes the process of stripping very easy. The finished negative is put upon a levelling-stand, a solution of gelatine is poured over, and when this is dry, the whole film may be readily separated from the glass with a knife.

Will not some practical photographer make experiment in the studio with robes of different material, and let us know the result of his research? Many of our practised portraitists must possess information on the subject that would be really valuable. Some time ago white satin was vehemently tabooed; now, a lady in a glossy robe of this material would be welcome in most first-class studios.

Touching pirated photographs, we are sorry to see the clever Chicago baby pictures, "Good Night" and "Good Morning," have been extensively copied. The happy conception and artistic arrangement in these pictures ought to have secured them from such treatment, if there were any honour among thieves.

Topics of the Day.

LENS, OR NO LENS?

BY JOHN SPILLER, F.C.S.

A SUCCESSION of very bright days in the early part of May tempted me to return to a course of experiments suggested by Captain Abney's remarks on "the Natural Camera," at the April meeting of the Photographic Society. I may remind your readers that, on the occasion referred to, Captain Abney brought forward some suggestions, based upon the recent statement of Lord Rayleigh, to the effect that it might be worth while trying, with the rapid gelatine plates of the present day, to obtain photographs with a camera provided only with a pin-hole aperture instead of a lens; or, if this should prove too slow, to employ a long focus spectacle lens with very small stop.

In the course of discussion upon this communication, I stated at the meeting that Mr. Crookes and myself had already, more than a quarter of a century ago, made experiments in the same direction, and arrived at the conclusion that the exposures required to be so prolonged that the process was deemed impracticable. The conditions being more favourable with the highly sensitive plates of the present day, I resolved to return to the subject, and give you now my latest experiences.

Working with my 7½ by 5 inch camera, and Bennett's "rapid gelatine plates," I gave an exposure of ten minutes with a pin-hole aperture (without a lens), and got a picture; the subject being a newly-painted house illuminated by bright sunshine. In order to get a circular field of five inches diameter on the focussing screen, it was necessary to work at nearly ten inches distance from the front aperture. This made the light very feeble; but when I contracted the bellows to 5 inches, the field of view was of course only half the former diameter, and a 2½ inch plate would have taken the whole picture. This being too small for all practical purposes, I preferred to expose for the larger size, and used accordingly the 7½ by 5 inch plate, for which my camera is fitted.

On developing with alkaline pyrogallic, I got, as already stated, a picture, but the details were so confused, that no photographer would be satisfied with the result. It was perhaps a trifle over-exposed, so that I may say eight minutes is the proper time for the subject, taken under these circumstances. I then measured the aperture I had been using, and found it to be exactly ·055 inch. It was a bevelled clean cut hole bored in wood with a steel tool, and when I laid upon it a little micrometer plate divided to ·005 inch, I found that the diameter exactly covered eleven divisions = ·055 inch. To assist in getting accurate measurements, I read off the divisions under the magnifying power of a Stanhope lens.

Comparing this result with Captain Abney's statement, I do not find his conclusions exactly borne out, for he says:—"Suppose we wish to find what aperture we can employ for a ten-inch focal length, we proceed by Lord Rayleigh's formula (calculation given in the PHOTOGRAPHIC NEWS, page 200), and conclude that the diameter of the aperture must therefore be about one-fiftieth of an inch to secure good definition." But I used a stop considerably larger, viz., eleven two-hundreths of an inch, and yet the image was so dim that I required eight minutes' exposure to get a picture. If I had used the very diminutive aperture of one-fiftieth of an inch, by the well known rule, I should then have required about seven times as long for the exposure, or very nearly an hour.

I note that Captain Abney promises to get a landscape fully exposed in *eight minutes* through an aperture of one-fiftieth of an inch. I can only say that with bright sunshine I failed to do it.

Further experiments were made with spectacle lenses stopped down to one-tenth of an inch, but until the focus was shortened to eight or ten inches, the image was very dull, and then we encountered the old difficulties of visual and chemical foci not coincident. We know, of course, that the image of the sun can be secured through very small apertures, but turning the camera upon a landscape, it does not appear to me that either the pin-hole, or spectacle lens stopped down, will do much better work than it did for us in 1854, so that the recommendation of our gallant friend—who forgot to take his lens on a certain occasion in India, and used a pin-hole instead—should be answered by saying that if, in England, a landscape photographer should happen to start away without his lens, he had better go back and fetch it, for his chance of success would otherwise be very remote.

The "Topic" next week will be, "Subterranean Photography," by J. Streatfield Cox.

Reviews.

PRACTICAL PHOTOGRAPHY. Illustrated by O. E. Wheeler. (*The Bazaar Office*, 170, *Strand*, *W.C.*)

WE have been favoured with a copy of "Practical Photography," which contains much that is commendable. It describes most processes connected with photography that have been before the public for the past twenty years, and supplies information alike valuable to the beginner and the practised photographer. Moreover—and this is a point to be insisted upon—its contents are carefully indexed, so that the subject matter is ready to hand. The only fault of the volume appears to be that it has been apparently some time in compilation, for undue prominence is given to fleeting changes, to the prejudice of the recent and more important discoveries, such as those connected with the gelatino-bromide process.

ON THE USE AND ABUSE OF ACCESSORIES.

BY S. BOTTONE.

IT has been my lot lately to pass in review a considerable number of portraits (some 5,000) by different photographers, some of note, others of no particular repute. Very few indeed were defective in point of manipulative or technical skill; in fact, it may be fairly said that as photographs they all rank high. Good clear high lights, fine detail in the shadows, and roundness in the image, were observable in all; but there was a marked difference in the treatment of the accessories, that rendered some highly satisfactory as artistic productions, while others struck the observer with a sense either of ludicrous oddity, or painful incongruity. A few examples will render this clear. A studious youth is seen sitting with his back to a closed window, the bars of which project from his head and shoulders, so as to give him the appearance of being crucified. Another portrait represents a beautiful girl, dressed in a flowing robe, leaning against a "rustic" tree stump, embellished with a gnarled knot or scar, at about half its height; the effect of which is, that the picture forcible impresses the mind with the idea that the girl has bared her right leg, in order to show that she is afflicted with elephantiasis, complicated with a huge ulcer. Again, a venerable old man with a long flowing beard, and hair brushed up into a tuft, is seated before the crater of a volcano in active eruption, so that his beard and hair seem to participate in the general state of cataclysm. Another picture represents a gentleman leaning against or supporting his bicycle; but what has that heavily draped curtain to do with bicycling? Among others is seen a lady with one foot on a stile, with her body bent so as to give a very fair representation of an isosceles triangle.

These are a few, and only a few, of the more glaring defects in the management of accessories. But, in a quieter way, inartistic treatment pervades nine-tenths of these portraits. Too much prominence is given to the accessory, be it table, couch, pillar, vase, or what not. Most of these "artistic" articles of furniture are highly finished, carved, decorated, and varnished, or polished, so that in the complete picture they come out so painfully sharp and distinct as to render them the leading "object." It is impossible to acquire artistic taste all at once, and its full possession is certainly not granted to us all; still it is as much within the reach of him who dedicates himself to the production of a portrait by photography, as of him who employs the brush to the same end. The acquirement of a refined artistic taste depends to a large extent on a careful study of the beautiful in nature; in a careful avoidance of all harsh and discordant lines; in an intelligent observation of the nature of the desired picture, so that nothing incongruous may appear; and, above all (in such small work as our cartes and cabinets,) a studious avoidance of anything like prominence in the accessories, allowing the "poser" (in two senses) to be the main feature in the picture. In fact, a picture with a plain background is certainly preferable to one in which the eye is distracted from the portrait, to notice some exquisite detail in the crispness of outline of a pillar, of an elaborately carved table, or of the fringe of a settee. Let it be borne in mind that accessories must be accessory, and not principal; that the direction of the light must be carefully followed throughout; that no awkward position of the arms or hands be allowed to appear—a point often overlooked—so that angularity or apparent want of limbs should not make what would otherwise be a pleasing picture, a laughable caricature. By following these general rules, though our pictures may not compete in artistic composition with those of a Rejlander or a Nesbitt, we may feel confident of a result that shall not offend the educated eye, but shall afford a feeling of pleasure to the beholder.

◆

NEW DISCOVERY REGARDING GELATINE EMULSION.

BY L. WARNERKE.*

Some short time ago, when investigating the nature of the photographic image developed on gelatine plates, I observed that the portion of the gelatine emulsion submitted to the combined action of light and the developer became insoluble in warm water.

The discovery of this new principle led me to make numerous applications of it. Gelatino-bromide emulsion in my hands proved useful in every branch of photography, and, in my communication to-night, I intend to make you acquainted with the broad principle, as well as with a general outline of its applicability to various ramifications of the photographic art.

The first and the most important application will be to negative-making generally. I proceed in the following manner. A sheet of paper is covered by the ordinary gelatine emulsion and dried. A precaution to be observed is, that the coating of the emulsion must be uniformly homogeneous, and when the sheet is dry that it remains flat. This paper is to be used, instead of a glass plate, in the camera—in fact, in all cases where sensitive plates are used for obtaining negatives or positives. The exposure is in accordance with the sensitiveness of the emulsion, but it remains strictly the same whether the emulsion is spread on glass or on the paper. The exposed sheet of gelatinized paper is next developed with alkaline pyrogallol development, exactly in the same manner as with the glass plate. After development it may be fixed, or it may not; then it is preferably dried. Insolubility of the developed portion is produced as soon as the image is fully developed, but it is not so complete whilst the film is still wet. The same is the case with the action of alum on gelatine; and for this reason it is advisable to dry the image before the next stage of the process, which consists in removing by solution in hot water all parts of the emulsion film not acted upon by light and the developer, and which consequently remain soluble in warm water. The action of light and the developer penetrates into the thickness of the film more or less in various parts of the image, according to the intensity of the light. It follows from this that under the insoluble portion of the image there may still remain some gelatine not reached by the light and the developer, and consequently soluble. It would be therefore useless to put the sheet bearing the image in warm water just as it was developed, because the image, also insoluble, would be "under-washed" and beyond possibility of recovering. This explanation is only necessary for the very few not acquainted with the principles and practice of the carbon process. In reality from this point I follow exactly all the rules of the carbon process—that is, the gelatine surface of the paper bearing the image must be cemented to some impervious material, and washed from the back or paper side until all soluble gelatine is removed.

Now what impervious material is to be chosen? This choice depends upon the destination of the developing image. In the case of negatives, glass is very convenient; and it may be used without any preparation, or it may be collodionized, or varnished with gum-dammar, or other varnish, or waxed. Cementing the image is produced by putting the gelatine surface in contact with the support under water, and removing with a squeegee all superfluous water; when unprepared glass is used, it is advisable to leave the image there until it is dry; in all other cases only for a few minutes.

Next the glass, with the paper cemented to it, is plunged into warm water, and very soon the paper, which is thus loosened, can be stripped off, and all the soluble gelatine washed away, leaving only the insoluble portion forming the image. This is washed in cold water, and the negative is finished.

It will be observed that this negative, when used for ordinary silver printing, will give reversed images. This can be obviated by several means; by cementing the developed image to transfer paper, which is made by rendering the paper water-proof, and greased on the surface (an excellent paper of this description is supplied by the Autotype Company, under the name of "flexible support"), and, when the image is finished, to transfer it to glass, on which it will remain permanently; or by using a paper bearing a film formed of collodion or insoluble gelatine, or a combination of the two. In this case the image will be produced on the film, the paper being stripped off by rubbing turpentine on it, as was indicated by myself for my sensitive negative tissue; the printing in this case can be done from either side. Lastly, the image can be developed on the collodionized glass, the glass being first rubbed with talc; it can then be backed with my previously described film-tissue, or with a sheet of gelatine, or the film can be made by coatings of collodion or gelatine, and, when dry, stripped. By either of these methods the negative can be reversed without any difficulty; but, for myself, I prefer to have it on the film, and this can be produced of sufficient thickness to form not only the substitute, but also the nearest approach in appearance to glass.

Now, when the method of obtaining negatives by this new system is explained, the question can be put, What advantage is gained? I reply, the advantages are many and important. With the certain quality of the emulsion on the glass, when compared with the same on the paper, the result is easier to obtain, and it is of superior quality on the paper.

Everybody who uses gelatine plates (and who does not use them now?) is familiar with the difficulty in estimating the exact exposure, and frequent failures are produced by over-exposure. Only a correctly timed exposure will give a negative possessing vigour and brilliancy: a slight over-exposure gives an image flat, weak, and veiled; this is the natural drawback of glass plates; it was known in the collodion time, but only the superior sensitiveness of gelatine made us fully acquainted with it. The very same gelatine emulsion on the paper does not produce the evil effects of over-exposure just described. This assertion is too important to advance without proving it by actual experiment. There is here a sheet of paper covered with gelatine emulsion, and a glass plate covered also with the very same batch of emulsion. In this black and opaque paper I cut holes, and by putting these simply made negatives, one in contact with the paper, and the other in contact with the glass, I give very long exposure to the light. The image is visible in both cases. Next I develop the paper and the glass simultaneously in one dish. The developer is purposely made very weak, and well restrained, in order to have the image coming up as slowly as possible. Let us now watch attentively the behaviour of the two negatives: on the glass plate at first the image appears black, as normally it ought to be; but very soon we begin to observe that the portion of the plate totally protected from light by the opaque part of the black paper begins to blacken, forming a halo round every figure developed normally; this halo extends more and more, as the developing continues. But, lo! another change. The originally black image has turned into a white one, while the halo extends to almost the whole of the plate; and now the reversal of the image is complete. Meantime the paper-film image is free from blurring halo, and also is not reversed. Exactly the same happens when negatives are taken in the camera. Over-exposure produces blurring and fogging of the plate; this produces flatness; but, if the over-exposure is continued, partial and even total reversal of the image takes place.

---

* Read before the Photographic Society of Great Britain.

What is the cause of these striking phenomena? A complete explanation can be made of halation and blurring, viz., the light acting on the gelatine surface penetrates it, and, being reflected from the back of the glass as well as being dispersed through the thickness of the glass, acts on the sensitive surface from the back, and hence the phenomena observed. As regards the reversal of the image, I confess I am not clear as to the cause why it does not take place on paper, and I hope that Captain Abney, who has studied this question, will be able able to fill the gap caused by my ignorance. However, I take this opportunity to place before you the facts gathered during my investigation. I believe that the reversal of the image on the glass is due to the following reaction:—By the action of light, part of the bromine forming bromide of silver is liberated. When the image is developed, in the first instance, it has a normal appearance; but the water of the developer subsequently forms hydrobromic acid, with the liberated bromine, and this, acting on the previously precipitated silver, forms again bromide of silver, which, dissolved in the fixing solution, is the reason of the reversal of the image.

Apparently, the very same reaction must take place in the paper negative. However, from the different definite result, I had doubts about it, until, upon making experiments similar to the one just described, the following incident happened:—One of the persons present, by mistake, opened the printing-frame in the light, and this caused a small amount of light to act on the whole surface of the paper. In developing, that naturally produced general fog all over the plate. When the development was almost over, the fogged sheet was kept inclined during examination, when, to our astonishment, the fog began to clear up, and this in such a manner as if some clearing solution was exuding from the developed parts only, and running in the direction commanded by the incline of the sheet of paper. This incident, purposely produced several times afterwards, taught me that on paper, as on the glass, the bromine liberated by light forms hydrobromic acid with the water of developer; but why it does not act on the developed image in the same way in the case of a glass support I am not able to account for.

Greater latitude in the exposure is not the only advantage gained by the new process; there is one more important still. Since gelatine plates came into general use, lowering of the standard of excellence has been observed in the results obtained: the last Exhibition, according to competent authority, is an illustration of this assertion. Equally good authority has found the reason of this in the impossibility to intensify satisfactorily gelatine negatives. I do not mean to insinuate that gelatine cannot give an intense negative—just the reverse; but the best negative by the wet collodion process is generally produced when the first developed image is not sufficiently intense, but is subsequently brought to its final condition by intensification.

This mode of procedure, desirable also in the case of gelatine, cannot be resorted to, owing to the impossibility of intensifying these negatives satisfactorily, because silver intensification stains the film all over, while the only available mercurial intensifications are to be discarded for different reasons.

Negatives produced by the process just described have no gelatine to be stained, and consequently are quite as fit for silver intensification as the old-fashioned wet collodion. They permit also the application of several other systems of intensification not yet known; viz., when the negative is quite finished, and on the plain glass surface, the application of any soluble colouring liquid stains the image a corresponding colour, the intensity of which is in proportion to the thickness of the gelatine, and consequently in proportion to the action of the light. Very beautiful results can by these means be produced for other purposes than intensification, viz., for chromo-transparency, and they are especially very pretty for the optical lantern or the stereoscope. It is remarkable that, if the developed image is not very intense, the coloured image has the appearance as if it were formed entirely from the colour used, to the exclusion of the colour of precipitated silver.

There is still another mode of changing the colour of a developed image. I found that there are many substances that can be mixed with gelatine emulsion without producing any action on the quality or sensitiveness. If ordinary water or moist colour is ground up in the emulsion, the developed image will retain all this colour, while in other portions it will dissolve together with the gelatine containing it. By this means a great variety of colour in the image can be produced, some of very pleasing effects, closely resembling the silver-albumen print, toned or untoned. This can be applied simply to confer greater intensity in the negatives, or it can be used as a print when developed on paper or canvas. All other modes of intensification known can be applied in this case, but, among others, treatment with permanganate of potash, giving such a satisfactory result in carbon transparency, is recommended.

Now I proceed to show you the manipulation of the process in practice.

This sheet of paper bears a developed image with pyrogallol. One half of the image is fixed with hyposulphite of soda, while the other half is left unfixed; cemented with the squeegee to the surface of glass, it is immersed in tepid water; on this occasion all the rules that are good for the carbon process are literally applicable in this process; for instance, the water must not be too hot. The paper is peeled off, and you observe how the still soluble bromide is running down. Part of the image is purposely left unfixed; white bromide emulsion, when running under the action of warm water, enables you to watch the rapidity of the solution, and also the moment when the development is completed. Now it is complete, it cannot escape observation that the unfixed part is a great deal more intense than the fixed part. Evidently there is something more left on the image than pure metallic silver—something soluble in the hyposulphite; however, the lights are clear, and this something is not affected visibly by light, so that in many cases, when intensity is desired, fixing can be usefully omitted.

In describing the mode of working, and the advantages of the new process for negatives, I must mention that, to use paper in the camera, some alteration in the apparatus must be introduced. The ordinary slides, although excellent for glass plates, are not of the best form that can be desired for paper negatives. I have no doubt that in the old pre-collodion epoch of photography, the users of Callotype paper knew also the best slides for it, and perhaps among an old, long-forgotten bundle of apparatus, a useful hint might be discovered for a practical form of the slide most suitable for sensitive paper. It was not my good fortune to come across such a valuable hint, and, therefore, I had to design one for myself. It is out of the question to put the paper between two glasses; glass had better be eliminated altogether. After many trials I have come to the conclusion that the roller-slide is the most convenient system. One I described here, and used by many in connection with my sensitive negative tissue for the last seven or eight years, need not require being described again. A band of paper sufficient for many negatives can be successively presented for exposure in the camera by acting on the projecting knob of the roller. In my original roller-slide an opening in the shutter, protected with orange glass, permitted the watching of the number printed on the boundary of every length of negative. With a very sensitive gelatine tissue, which I perfected some time ago, this opening was inadmissible, since the light passed through the glass, and ruined every negative. I had then recourse to an electrical bell-alarum, which sounded when each negative was completely rolled away from possible harm; this system, tried during my last travel in Russia, permitted me to expose over three hundred negatives with perfect success. Recently, however, I have constructed this model before you, in which the position of the paper is recorded in a much more simple manner, and one that cannot possibly get out of order. On the boundary of each length of tissue answering to the size of the negative, a hole is perforated; a spring acting on a system of levers gives notice of the position of the paper by projecting a brass knob, which disappears instantly the hole is passed. A revolving shutter, instead of a sliding one, is another very useful innovation.

Whilst considering that the roller-slide is perfection for outdoor work, I must admit that it has certain disadvantages when it is used at home, as, for instance, the necessity for cutting out every negative for development; and then the joining the band again is troublesome. Under these circumstances I have constructed this slide, which will take a flat sheet of paper: it must be considered only as a rough model, but slides on this principle will also prove useful in the field, being very light, and only $\frac{1}{8}$ inch in thickness.

It now remains for me to give an outline of the application of my invention to other branches of photography. You observed, in the negative just developed, that the image has considerable relief, and that this relief is greater in proportion to the intensity of the image: this suggests its application to the Woodbury printing process. The emulsion for this purpose must be in a thick layer, and not so opaque as to enable the light to act deeper, and by these means produce a greater relief. The image need not be reversed, as is the case with the ordinary process. The same image in relief can be utilised for numerous photo-engraving processes, having this advantage over chromated gelatine, that it can be produced quickly, and even by artificial light. Grain, when necessary, can be produced by mixing suitable substances with emulsion.

Another important application of this invention is to the photo-ceramic or burnt-in photographs on enamel porcelain or glass. Vitrifiable powder is mixed with the emulsion, which emulsion in this case is principally that giving only a very thin image in development the image, when developed on the suitable enamel porcelain or glass surface, is fluxed and submitted to the action of heat in a suitable furnace. It is of the greatest importance, but it is also of considerable difficulty, to be able to eliminate the gelatine from the image before it is put into the furnace, because, if this is left, the whole is raised in large blisters, and in this condition cannot be burnt-in. In this invention, however, when the emulsion gives only a faint image, the quantity of gelatine left is so small that it can be carbonified without the bad effect of blisters and cracks; this enables me to recommend the process. I pass for examination this glass plate on which the image in vitrifiable powder was produced; part of the plate was fired on the blow-apparatus and is totally vitrified; the other part, which is much darker, not having been submitted to sufficient heat, shows how perfectly all the gelatine of the image is carbonified without being cracked or blistered; lastly, the lower corner shows the image not acted upon by heat. My last remark is as to its application for phototype printing, having observed that the part exposed to light takes a greasy printing-ink; a very easy application to this kind of printing can be imagined.

REDUCTION OF OVER-PRINTED PROOFS.

BY W. ENGLAND.*

A SIMPLE and certain method of reducing over-printed proofs has been one of the wants long felt by all photographers. It is well known that, in every photographic establishment, even the most careful printers cannot always be sure of getting the exact depth of tone required, and proofs occasionally get over-printed. Of course, prevention is better than cure; but, when a remedy is necessary, the method I am about to describe answers admirably.

I tried a great many experiments before I succeeded to my satisfaction. I found that cyanide of potassium totally destroyed the print, even when used moderately strong. By using a weaker solution it was well under control, and the exact depth could be readily obtained; but, during the washing to remove the cyanide, the action of the latter continued, and spoiled every proof. I then tried several methods to arrest the action of the cyanide; but without success. It then occurred to me to use the cyanide in such a weak state that but little should be held in the paper, only sufficient to reduce the print to the required depth. For this purpose I made a bath of only four drops of saturated solution of cyanide to a pint of water. The prints immersed at first showed no signs of getting lighter; but after about an hour the most perfect results had been obtained with prints considerably over-printed. With lighter pictures a less time is required. Proofs treated in this way lose nothing of their tone during the after-washing, which should be thoroughly done, and, when dry, retain all the brilliancy of an ordinary print. I enclose you a proof, one-half treated in the way described.

Correspondence.

MR. HENDERSON'S THURSDAY EVENINGS FOR PHOTOGRAPHERS.

DEAR SIR,—In your report of my demonstration, you have evidently failed to see the important points in my method of making emulsion. In the first place, I increase the rapidity in the same proportion as I convert the silver nitrate into ammonia nitrate; for example, if I convert (say) 20 per cent. of the silver into ammonia nitrate, I do not get so rapid a plate as I should if I converted more or all the nitrate. Another important point is that the bromide of silver is formed in an excess of silver, thereby also giving greater rapidity and density, and a thick or viscid substance is easier diffused into a thin than *vice versa.* I have been asked by several persons, including chemists, how I am to make a solution of ammonia nitrate of silver, and add it to a pure solution of silver nitrate, without forming fresh oxide of silver. Many of your readers may not be aware that they can have ammonia nitrate of silver in three forms, viz., in an acid condition, in a neutral, or in an alkaline state. The two first may be mixed with a neutral or acid solution of silver without precipitating oxide of silver, and in making emulsion I prefer the neutral.

I have been perfectly inundated with questions regarding this matter, that I think it would be advisable to give another demonstration.

A slight guide as to the rapidity of emulsion made by converting the whole of the silver into ammonia nitrate may be added. Working in the studio, I take in a good light, with a No. 2B lens, No. 2 stop, the cap off and on as rapidly as I can, and obtain a fully-exposed negative; but of course, with such a plate as this, extra precaution in the preparation is necessary. I use Mr. Edwards' lamp, with a dark ruby chimney (one that will stand the spectroscopic test), and a petticoat of two thicknesses of ruby paper; even this light is not very safe.—I remain, sir, yours respectfully,

A. L. HENDERSON.

[There is no doubt that the sensitiveness of such an emulsion bears some relation to the proportion of silver converted into the ammonia compound.—ED.]

LECTURE ON PHOTOGRAPHY AT THE POLYTECHNIC.

DEAR SIR,—I think photographers ought to know that Mr. J. C. Hepworth is giving a lecture on "Photography" at the Royal Polytechnic Institution, London. This lecture is admirably delivered, and is very interesting, as an enlargement is taken and developed in sight of the audience, by means of the new argentic gelatino-bromide paper introduced by Messrs. Morgan and Co., of Greenwich I may mention that I was courteously allowed to examine the enlargement (after the lecture), which I found to be a very capital one, of good colour, the size of the paper being full imperial, measuring 30 by 23 inches, taken with an ordinary limelight, with seven seconds' exposure, and developed with ferrous oxalate in about two minutes. The paper—as, perhaps, is known to but few—is placed in front of the enlarging-lantern in a dry state, so that photographers can keep a stock by them, and always be prepared to make an enlargement with but very little trouble; and the time occupied in so doing is so small, that it will surprise many of the votaries of our art who see the result for the first time.—I am, sir, yours faithfully,

ROBERT HELLIS.

COLLODION EMULSION ON PAPER.

DEAR SIR,—I see in the last number of the PHOTOGRAPHIC NEWS, May 13th, in your report of the meeting of the South London Society, that Mr. William Brooks showed a negative and print from collodion emulsion on paper, stating it to be more rapid than the ordinary mode on glass. I should feel much obliged to Mr. Brooks (and probably other workers would also) if he would kindly give through your columns his mode of working collodion emulsion on paper. He is, I know, an old worker with collodion emulsion. I have for some years past used collodion emulsion on glass, and very excellent it has proved, and when used wet, quite as rapid as wet collodion.

Regarding Dr. Eder's late formula for clearing fog from gelatine negatives, I have just tried it on a very foggy negative (almost unprintable, in fact, from red fog) and found it answer quite well, giving a very fair and printable negative. But I tried it also on one that was fogged and afterwards treated with mercury without effect. I also tried it with a foggy negative I had collodionized for printing, but found the solution only partially penetrated the collodion, and acted in patches where it penetrated.

---

* A communication to the *Photographic Journal.*

I shall be glad if you, Mr. Editor, or some of your readers, will advise me how to make a negative that has been collodionized and dried easily penetrable by solutions either for intensification or reduction. I have tried alcohol with only very partial success.—Yours truly,

Francis W. Turton.

HOLMES' OZONE BLEACH.

Dear Sir,—Having read the letters which have appeared in your paper between Mr. W. E. Debenham and Mr. S. Fry, I should feel obliged by your inserting this. Having myself used, with great success, Holmes' ozone bleach, I can confidently say that, after using hydrochloric acid, which has a tendency to dissolve the film, then Cowell's mixture of citric acid and alum, and finding the negative still too intense, I have afterwards used the ozone bleach, without loosening the film, and obtained a good printing negative. I certainly believe it to be a valuable reducer, if properly diluted.—I am, dear sir, yours faithfully,

Chas. F. Wing.

THE NEW MACHINE FOR LEVELLING AND COATING PLATES.

Dear Sir,—In reference to the new levelling machine for gelatine plates, which was deemed of sufficient importance to have the leading article of this week's Photographic News devoted to its description, I am quite at a loss to understand by what incident of inadvertance Mr. Cowan has been made to appear as its originator, the more especially as that gentleman distinctly stated at the meeting of the Club, the South London meeting, and Mr. Henderson's meeting—where he exhibited his model—that, beyond the introduction of the propeller, as there shown, he claimed no originality with respect to the apparatus, he having seen it in use at my place only a few days previously.

Far be it from me to impugn the honour of Mr. Cowan, or any other gentleman; but I think it only fair that the matter should be placed in a proper light before the photographic public. With regard to the machine itself, I most unhesitatingly pronounce it a failure as compared with the improved form I am now using, a model of which I exhibited at Mr. Henderson's meeting, and the special meeting of the Parent Society on Tuesday last. This fact, I believe, was fully recognised by many who saw the two models, and from whom I received warm congratulations; one of the principal makers of gelatine plates was so struck with the apparatus, that he requested me to furnish him with one forthwith. I may say that I do not pretend to claim entire originality in the matter myself, although it has caused me much anxious thought, and occupied a great deal of my time, having received much valuable assistance from Mr. Farlie, a brother photographer in Woolwich, who was formerly a mechanical draughtsman employed in the Royal Arsenal.

Allow me to say, in conclusion, that I shall be very happy to show the machine in action to anyone interested in the subject, whenever he may feel disposed to give me a call.—Yours, &c., W. Cobb.

Woolwich.

Proceedings of Societie

The Photographic Society of France.

A meeting of this Society was held on the 6th inst., M. Peligot in the chair.

It was announced that a photographic exhibition would be held at Frankfort during the month of August. A retrospective exhibition will also take place at the palace of Versailles, dating from June 1st till July 15th.

M. Comte, writing from Chantilly, stated that he had prepared gelatine emulsion by daylight, afterwards washing it in a 2 per cent. solution of bichromate of potash, a satisfactory result being obtained without any sign of fogging.

M. Bascher sent a dry collodion tannin plate prepared in March 1872. Last October it was exposed for almost twice the time necessary for a negative recently made, and developed with the addition of a few drops of a 7 per cent. solution of silver. The negative was good, but slightly solarised.

M. Krenesz makes use of the following emulsion for obtaining glass positives by exposing behind a negative. Sheets of gelatine are immersed in a 7 per cent. solution of silver until they become soft. As soon as the surface is dry the sheets are plunged in a bath composed of—

Water	100	grammes
Bromide of ammonium	8	,,
Ammonia	2	c.c.

When they have become uniformly white they may be well washed; the emulsion is then ready to be melted, filtered, and spread on the glass, and an exposure of five or six seconds is required in a diffused light.

A method of obtaining very finely divided bromide of silver suitable for making emulsion by simple mixture with gelatine has been suggested by M. Lohse. Bromide of potassium is dissolved in the smallest possible amount of water, about an eighth part of the gelatine ordinarily required is added and dissolved by slight heating, solid nitrate of silver is introduced, and, after boiling for half-an-hour, sufficient acetic acid is used to preserve the gelatine in a liquid state. This mixture is stirred into a cylindrical vessel filled with distilled water and left for a few days, after which time the bromide of silver is deposited at the bottom in the form of a clear paste.

Dr. Vogel has found that a saturated solution of carbonate of soda in place of ammonia is preferable in the development of his emulsion.

Extracts from foreign journals on the properties of different varieties of cellulose, and various other matters, were referred to by M. Bordet.

MM. Fortier and Londe presented a support for thin sheets of celluloid. It is a plate formed of some rigid substance, as wood or card, over which is spread a film or paste composed as follows:—

Gelatine	50	parts
Sugar	50	,,
Sulphate of baryta	115	,,
Glycerine	300	,,
Water	190	,,

The sheets of celluloid adhere easily to this paste, and after exposure they may be easily detached.

M. David showed some very thin sheets of celluloid, and gave the following formula for a paste with which to fix them on a rigid support:—

Water	20	parts
Gelatine	5	,,
Glycerine	50	,,
Glucose	25	,,

M. Stroubinsky next spoke on zincography. Working in St. Petersburg, where zinc is not easily obtained, he uses copper plates coated with a solution containing 5 per cent. of gum-arabic and 2 per cent. of bichromate of ammonia. When dry they are exposed behind the negative for two or three minutes in full sunshine, or in diffused light up to half-an-hour. The plate is next covered with a solution of bitumen of Judea and drying oil in benzole, and as soon as it is dry it is soaked in water for some time. The image being scarcely visible, it is coloured with logwood. The back of the plate is varnished and plunged in an alcoholic solution of perchloride of iron, at the end of half-an-hour it is taken out, the high lights coated with gum, and the plate inked.

M. Stroubinsky next stated that as varnished negatives were so difficult to retouch, whereas, unvarnished, the film was easily erased, he covered the plate with a solution of 10 per cent. of gum, and 3 per cent. of bichromate of ammonia. After drying and exposing to light, it is soaked in water for five minutes, and then allowed to dry.

M. Londe presented a mechanical shutter, allowing the time of exposure to be estimated.

M. Stoerk sent, through M. Audouin, several bottles of his gelatino-bromide emulsion, stating the terms of his patent. It is pronounced free from any tendency to frill or blister. By the introduction of an antiseptic liquid, the emulsion may be preserved indefinitely in a fluid state.

MM. LONDE and VIDAL gave an account of their experiments with M. Jonniaux's emulsion; they obtained good results, but it did not prove very sensitive.

M. RAOUL CLEMENT presented a note on theoretical and practical considerations of the time of exposure.

M. DAVANNE presented, for Capt. Bing, a pamphlet on a new method of obtaining positive transparencies in the camera.

M. AIME GIRARD gave an account of his researches on hydrocellulose.

M. AUDRA has been studying the action of alkaline bichromates on gelatino-bromide of silver, as reported upon by Capt. Abney, about a year ago. The effect of immersing a plate for fifteen minutes after exposure in a one per cent. solution of bichromate of potash rendered the image slow to appear during development, and caused it to disappear during fixation. A second plate immersed for two minutes gave but a feeble image at first, afterwards becoming stronger, but still maintaining a great divergence from the portion of the plate not submitted to the action of the bichromate. M. Audra next experimented upon its action upon the emulsion in two different ways, adding the solution when in course of preparation. Both times the emulsion was made under the full light of a gas jet, and in preparing the second portion, it was boiled for two hours, and concentrated ammonia added, but in each the negatives were perfect, exempt from fogging, and highly sensitive. M. Audra then recurred to Capt. Abney, to whom thanks were due for having first studied this action.

M. JONTE exhibited an instantaneous shutter, which he and M. Simonoff had constructed, consisting of a kind of curtain resting on a cylinder capable of revolving on its axis, it being regulated by a weight and capable of adjustment from one-half to one-fortieth of a second.

Votes of thanks being passed, the meeting broke up.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE last meeting of the session of this Society was held in the Royal College of Science, Dublin, on Friday, the 13th inst., at 8 p.m., Mr. JOSEPH WOODWORTH in the chair.

Mr. J. E. TREFFRY was duly elected a member of the Society.

Arrangements were made to hold an outdoor meeting in the neighbourhood of Drogheda during the coming month.

Mr. CONAN exhibited a collection of prints in platinum and silver, taken from the same negatives and placed side by side for the purpose of comparison. Various methods were proposed for obviating the dull appearance of the former, which did not meet with the unanimous approval of the meeting.

The proceedings were then adjourned until the second Friday in October.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The next meeting of the Society will be held on Thursday, June 2nd, at 8 p.m., in the rooms of the Society of Arts, Adelphi. Mr. Archer Clarke will give an illustration of the "Gelatine Emulsion Process, and the Development of Gelatine Plates." The presentation print for 1880 will be ready for distribution.

THE ROYAL CORWALL POLYTECHNIC SOCIETY.—This Institution appears to be endowed with abundant vitality and energy, if we may judge from the circulars issued with reference to its forty-ninth annual exhibition: the day fixed for the opening being the first Tuesday in September. The Cornwall Society has done good, although unobtrusive, service in the cause of technical education, many important inventions owing their introduction to the Institution. The prize subjects in the various branches of applied science are well selected, and calculated to suggest useful directions for the exercise of inventive skill. Several premiums are offered for improvements in mining machines, naval architecture, practical mechanics, &c., while domestic and sanitary appliances are not neglected, a prize being offered for an improved means of making casement windows weather-tight—a point not altogether without interest to photographers. Photography occupies a prominent place in the work of the Society, as our readers are aware (see page 232 of our last number), while pure science, as represented by chemistry, physics, natural history, &c., is well cared for, numerous prizes being offered for essays, collections of specimens, and so forth. The Fine Arts have their importance duly recognised in most of the branches ordinarily practised, near a dozen medals or prizes being offered; and, moreover, an art union drawing or lottery is to exist in connection with the exhibition, the prizes being selected from exhibits by professional artists.

To Correspondents.

*** A cheque for two guineas will be given for the best practical essay "The Way to Preserve Negatives and Register Them." The following rules must be noted:—The article should be from one to two columns in length; it should be written neatly, and on one side of the paper only. All contributions must be received at the Office, 5, Castle Street, Holborn, by the 1st June, marked outside, "The Way to Preserve Negatives and Register Them." It is not necessary that the name should be printed in the article, but it must of course be enclosed to the Editor. The Editor will not undertake to return any rejected MS. In the case of two articles being of equal merit, the honorarium may be divided, but in any case *the decision of the Editor will be final*. The Editor will publish the title of other essays, to be written also on practical subjects, once a month.

BARIUM.—We are inclined to think that the fault does not rest with your formula, and if you take every precaution against the accidental action of light on your emulsion and plates, and employ a fair proportion of pyrogallic in your developer, you will probably obtain all the density that you require.

T. C.—Yes.

A. HENDRY.—We believe that the conditions are as you suppose, but you had better write to the Secretary at 5, Pall Mall East.

A. F.—The lenses which you possess will not serve for street views except in the brightest weather, and with very rapid plates. Under the circumstances, we would recommend you to obtain a cabinet lens, and make this serve for all the purposes you refer to. After you have obtained this, you would find a rectilinear or symmetrical, having a focus of about 4½ inches, the most useful additional lens to obtain.

CALYPSO.—Only when the party represented is also the holder of the copyright.

W. A. C. A.—As an average, we think that, rapidity being put out of the question, the results are not quite equal; but we would strongly recommend you to give gelatino-bromide plates a trial before resuming the wet process. Above all things, take care that you use a sufficiently safe light in all manipulations, and guard against over-exposure.

LITTLE NEMO.—The yield should have been 4¾ ounces if the chloride were pure and dry.

O. G. R.—Prompt action is no doubt necessary; but we would recommend a consultation with a respectable solicitor.

RICHARD ADAMS.—1. It is more soluble in cold water than in hot. 2. Precipitate by sulphuretted hydrogen.

L. JACOB.—It is evidently quite past recovery, and unless you are a sufficiently good workman to do the job yourself, you had better send it to a camera-maker to have the damaged part replaced.

N. LEIGH.—It would be well to make as perfect a copy as possible before attempting to remove the stains. A dilute solution of bleaching powder (chloride of lime) will probably answer very well; but it will also bleach the red and blue pigments present, leaving the carbon basis of the picture.

IGNORANT.—You cannot do better than apply to any leading photographer in your town.

PETER PERRY.—1. The incrustation consists of a basic ferric sulphate, a salt which possesses no value as a developing agent. 2. Only in the presence of a considerable excess of ammonia.

A. BURCH.—You would be quite at the mercy of your landlord in such a case, and you will be very unwise if you commence building your studio before you hold a proper agreement.

HUMOROUS.—The matter is purely personal, and would be of no interest to the greater part of our readers.

SMALL BOY.—A front lens from an ordinary achromatic opera glass, with its convex side next the plate, will answer fairly well. A stop, equal in diameter to about one-twentieth of the focus, should be fixed in front of the lens, and at a distance from it equal to about one-fifth of the focus.

WILLIAM BENNETT.—1. Not unless a special agreement has been made. 2. Try a smaller proportion of the iodizing solution. 3. It is extremely poisonous.

E. F. FOX.—Write to Messrs. Marion and Co., of Soho Square.

B. C. L.—1. The proceeding is illegal. 2. A licence is required; but in cases like your own the law is not usually enforced.

JOHN COOMBES.—It has been out of print for a long time.

M. WATTS.—It is not so easy to judge of the printing density of a gelatine negative as of one prepared by the collodion process, for slight variations in colour often correspond to very great difference as regards actinic transparency. If, however, you make a practice of soaking every plate in alum solution after fixation, you will obtain far less diversity of tint than would otherwise be the case.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1187.—June 3, 1881.

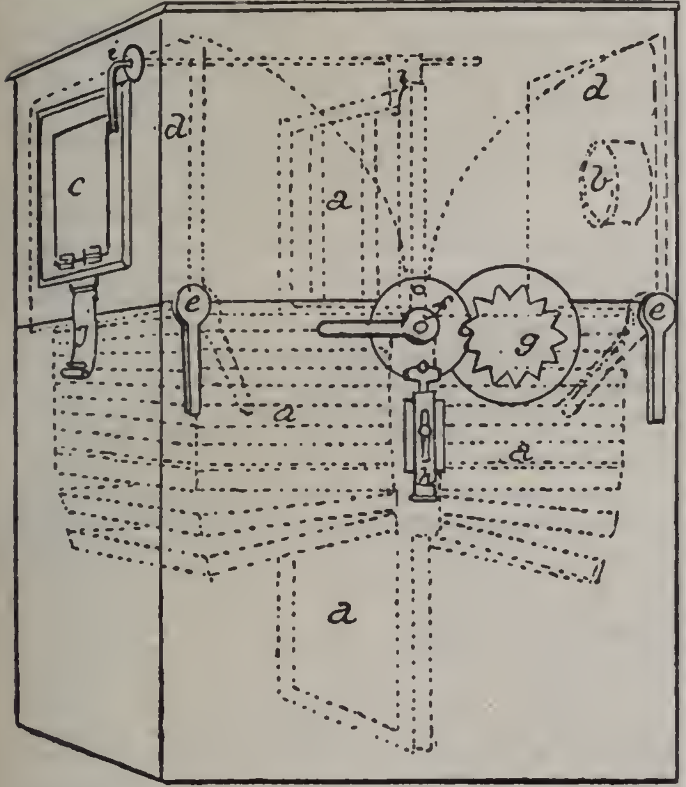
CONTENTS.

	PAGE
A Repeating Camera	253
Defects in Gelatine Dry Plates	253
Odd Jobs. By the Author of "Looking Back"	254
An Unsuspected Cause of Thin Images with the Ferrous Oxalate Developer. By Captain W. de W. Abney, R.E., F.R.S.	255
At Home—At the Prefecture de la Police in Paris	256
A Method of Estimating the Soluble Bromide Contained in a Gelatine Emulsion. By W. K. Burton	257
Notes	258
Topics of the Day—Subterranean Photography. By J. Streatfeild Cox	259
French Correspondence. By Leon Vidal	259
Gelatine Jottings. By A. Coventry	260
Correspondence	261
Proceedings of Societies	262
Talk in the Studio	264
To Correspondents	264

A REPEATING CAMERA.

A very compact and portable arrangement for exposing a number of plates in rapid succession and, at the same time, doing away with the dark-slide, has recently been introduced by Mr. Pumphrey, of Birmingham.

A rectangular box contains a series of frames or plate-holders, arranged in an endless chain fashion (as shown in the accompanying block, *a a a a*), one of them serving to hold a piece of ground glass for focussing, while the remainder are charged either with dry plates or with sensitive films, such as those manufactured by Mr. Pumphrey. The chain of frames is actuated by the handle, *f*, a quarter of a turn serving to move the band a distance corresponding to the interval between two successive plates, and an exact correspondence as regards position is insured by a clamp, *i*, which grips the top of that frame which is in position for exposure, while two shutters, *d d*, can, by means of the levers, *e e*, be so hinged down as to clamp the lower part of the frame, and hold it to its proper position. These shutters also serve to protect the stock of films or plates from light when the view is being focussed; this operation being performed by bringing t ground glass into the proper position, and observing the image through the door, *c*. In the case of the revolving stereoscope, which Mr. Pumphrey's camera somewhat resembles, these clamping adjustments are unnecessary; and it is worth considering whether it would not be practicable to so gear the handles *e e*, and *i*, together as to make one movement lower the shutters *d d*, and at the same time clamp the top of the frame containing the plate intended for next exposure.



By omitting the arrangement for focussing, an operation which has recently been shown not to be so universally necessary as was generally supposed, it might be practicable to carry two films or plates in each frame. In such a case two objectives would be required, one at *b*, and the other at *c*; and if the lenses were provided with the proper adjusting and exposing gear, the instrument in this form might perhaps be especially well adapted for certain kinds of detective camera work.

◆

DEFECTS IN GELATINE DRY PLATES.

Rapid gelatine plates are unquestionably a great boon to the photographer, for all that the negatives they produce are not always spoken of in terms of unqualified praise. We have again and again examined a week's work in gelatine negatives, all of them taken by an accomplished operator under the changing light of the studio. A number of the negatives proved to be perfect examples of photographic art; others, and they the majority, ranked as the "might have been good, but for," &c., &c. Not a few were decidedly weak, flat, and bad. Some of the plates had not been properly levelled after coating with emulsion. Upon looking along the edges of these, we found that they were so warped as to prevent their taking a true level under any circumstances. The glass, too, was of poor quality, and not free from air-bubbles and other blemishes. It is quite impossible to produce a good negative with a thin or an unequal film of emulsion.

The image must appear weak where the body of the emulsion is insufficient, or where the silver bromide has been mingled with an excess of gelatine, and used to coat too many plates. In the preparation of uniform and reliable plates, the proportion of silver bromide to gelatine and water should be always the same, and each plate should receive a measured quantity of emulsion. The glass employed should also be of the best quality, and perfectly flat. Owing to careless manipulation, it not unfrequently happens that both sides of a plate get coated with emulsion. In laying it down on the levelling slab some of the emulsion gets tilted over the edge and under the plate. The quantity required to produce the normal thickness of film is thus reduced, and the loss gives rise to the two-fold evil of a thin film, and a back not easily cleaned after treatment with alum.

Plates carefully levelled and coated with a suitable emulsion should require no after-intensification. It is possible so to develop such plates, even when over-exposed, as to produce good printing negatives by one operation.

Lack of knowledge in an operator is bound to yield a harvest of results in gelatine as extraordinary as unsatisfactory. There is no limit in this direction, but some of the complaints laid at the doors of the makers are not without reason. When it is an object to offer plates at the smallest price, we doubt if it is possible to bestow the greatest care in their preparation; so some allowance must be made for the price at which the plates are sold. This remark, however, is not levelled against low-priced plates, some of which we have found exceedingly good. It is meant, rather, as an argument in favour of using plates of the best glass, levelling them after coating uniformly, and preparing them with the greatest possible care.

Why should not patent plate-glass dry plates figure in the lists of manufacturers? When important work has to be done, it is not a question of the price of the plates; success hinges entirely on the fitness of the article supplied. The initial cost of plate-glass would be great, but we venture to say that its use would, in the end, effect a saving.

There is a new process looming in the distance whereby gelatine negatives may be taken on a paper support, and transferred to whatsoever plate may prove most suitable for their reception. We refer to the possibilities unfolded by Mr. Warnerke's invention. As in the coating of Autotype tissue, so with gelatine emulsion, the uniformity and thickness of the film may be regulated to a nicety. There is at present, however, the labour of double transfer in all cases where negatives are required for silver printing. This may possibly be overcome by floating off the film on its tough collodion support. Photography, in so far as gelatine emulsion is concerned, is indeed in the birth-pangs of progress, but without waiting for that perfection which the future may bring forth, it is wise to keep well to the front in plate-making and plate-using.

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No. 3.—Captain Mulligan's Horses.

The last "Odd Job," like the telling of jokes over a social pipe, wherein the laugh being over at the last quip, some one instantly starts off with "That reminds me," so the Lady and her Cat jogged my memory with regard to the present "Job."

I saw in a late number of the News that great difference of opinion exists regarding the best wind to photograph in. Mr. Dixon disliked the east wind while making his studies of animated nature in the Zoo, or, to put a truer meaning into the sentence, perhaps, Mr. D. did not dislike it so much as the lions and tigers, from constitutional reasons, objected to it; Captain Abney prefers a west wind; Colonel Stuart Wortley favours a north-west; and Mr. P. Jennings declares for no wind. It is my opinion that the gentlemen are all in the right; and if I expressed a partiality for a gentle balmy southern breeze, I should be in the right likewise—at times. Indeed, it seems like trying to split hairs to argue upon such a subject. With the object that has to be photographed rests the wish, by the worker, for wind or no wind. If, for instance, the object be a street, it must have a certain amount of wind, or the smoke will settle around and down upon it in clouds, rendering the making of a clear negative impossible. Now it is according to the direction of the street that the worker would like the wind to blow from some particular point of the compass. It might be the wild north, or the mild south, according to circumstances. For working in the pure country air, and making pictures wherein trees and foliage are the principal features, it then becomes almost indispensable that there should be no wind. For studio work—ordinary work—a clear day, with a moderate breeze blowing from anywhere, is what is required; if you can get it from scented groves, it is certainly preferable to chimneys. Thus it is that I say the above-mentioned gentlemen are all in the right; and I think that most of us, in a friendly way, should range ourselves alongside of Mr. Dixon and his lions, and unanimously show our dislike to that wind of all winds—the bitter east. There is another wind that I can cordially anathematize, and that is a high, dry wind, let it blow from where it likes In the studio, or in the field, it is the most galling and annoying of all the myriad of ills that besiege us; it is the most irritating, temper-trying evil; it is worse than yelling, fiendish babies; worse than maidens on whom the sere and yellow leaf has left its irredeemable mark; worse than foolish young men and silly old fellows. Custom has become second nature with us regarding these everyday troubles; but the high, dry wind comes only now and again (Providence be thanked!), when we get dust in our eyes, dust in our dark room, dust in our bath, dust in everything. Indoors it plays the deuce; outdoors it is—worse.

But, as "man proposes, and God disposes," we have to take things as they come in this sublunary sphere. Thus it was with me when Captain Mulligan's horses had to be photographed. The order was peremptory: "Be at Blunderbuss Barracks to-morrow morning at 11 o'clock, to photograph my horses.—Yours ever, R. Mulligan, 1024 W, Canton Cavalry."

Of what avail were my hopes, my fears, or my prayers? It turned out exactly what I hoped, and feared, and prayed against. The sun glared as only a spring sun can glare; the wind blew and the dust flew, cold and warm, and extremely disagreeable, all at once. Yet Captain Mulligan's horses had to be photographed.

We took a Thomas's tent to change the plates; a group lens (Dallmeyer No. 5 D), two dozen Wratten and Wainwright's plates, besides other lenses and sundry other things, in case of any unforeseen emergencies. When going to do a "job" that you may never have the option of trying again, you cannot take too many precautions. As we drove along, the wind seemed to freshen, and the sunlight grew more gold-like and dazzling, and accordingly my hopes went down, my fears went up, and my prayers—well, I do not think I remember them at that particular moment.

It was without doubt as bleak, cold, and miserable-looking a barracks as Dublin could boast, was Blunderbuss Barracks. The hard, dry wind seemed to blow from every quarter, to whistle round every corner, to sweep up and down every quadrangle, and to ultimately revel in perfect madness over the patches of sward up and around the officer's stables. Indeed, it was a perfect demon of a March day.

A beautiful day to photograph Captain Mulligan's horses, especially as they had not been out of the stable—except for a little exercise—for some weeks past. The first thing to be done was to select a suitable spot for my purpose, and here was my first difficulty. The only shaded spot with a passable background was so situated that the sunlight poured right down upon the lens. After a little thought I resolved to try one plate here, shading the lens, and fighting against the light; and one in the bright sunlight at an end of the square where there were no windows, thus presenting a grey wall for a background. Our changing tent being rigged in an adjacent shed, we now gave orders for the first charger to be brought forth. Our assistant, a true-born Pat, who prides himself somewhat upon his knowledge of horse flesh, having "be gad! driven a team of mules over the Rocky Mountains, sor—in America, sor!"—became somewhat excited at this point. He put his hat on one side of his head, stuck a straw in his mouth, and swaggered up to the stable door, humming "Oh, groom, bring forth my gallant steed." There was a clatter of feet, the folding-doors of the stable were thrown open, and out bounded a magnificent chestnut, dragging the groom along with him. So sudden was the noble animal's appearance, that Pat had hardly time to drop his straw, his hat, his hum, and seek safety from being trampled to death in an ignominious flight. For a second or two Captain Mulligan's charger sniffed the fresh air with dilated nostrils, and then, with a joyous neigh, commenced a vigorous series of calisthenics, by first standing on his hind legs, and then suddenly doing the same on the fore—bounding, leaping, curvetting, and finally dragging the groom round and round the square in a glorious gallop.

"Be gorra, sor!" quoth Pat, brushing his hat with his sleeve, and following the capering of the animal with admiring eyes, "he's a foine amiable beast. It's as good as a surkus to see him."

We acquiesced in the brute's fineness, but wondered how we were to get a picture of such a mercurial animal. At last he seemed to calm down; he was coaxed into the shadow, he was patted and "wowed" into a comparative quiet, and we proceeded with all despatch to focus. On a sudden his image disappeared from the ground glass, and, hurriedly looking up, we perceived the brute waltzing towards us on his hind legs, his ears laid back, and a business-like look about his features that there was no mistaking. It was our turn to run now. After capering round the camera in a most frantic manner—every instant threatening to send it into space—he was once more soothed down, and once more our heads went beneath the focussing cloth. At that instant a gust of the lively March wind brought an old newspaper whirling round the corner of the Bk. Stores, and our charger, recognizing at once the pressing nature of the occasion, started off on a furious stampede, with the paper and dust coquetting around him in a most playful manner. "Heaven and earth!" we exclaimed, "what can we do with such a brute?"

"Sure, ye's moight collar the camera and run after him," suggested Pat. And really it looked as if it was the only way possible, for, strange to say, he remained steady for a moment or so anywhere but where he was wanted. At length we obtained two seconds in the shade, and a flash in the sunlight, of him, and never was I more thankful than when I saw him dancing into the stable.

There was another charger, a much quieter brute—a hunter, and a spirited little pony and trap. There would have been next to no trouble with these, had it not been for the wind and the dust. Altogether, I exposed ten plates; one of these I knew to be of no use, owing to the cap blowing off the lens—or, rather, out of my hand—when putting it on.

I developed with pyrogallic, and, strange to say, found the plates that I exposed in the sunlight with only a flash rather unexposed; but the sharpness and steadiness of the animals could not be excelled. The plates taken in the shade were rightly exposed, but were thin, and wanting in contrast. One, especially, of the pony and trap, was so wanting in vigour, that I resolved, as I had another good one of it, to try strong measures with it. I, after fixing, flooded it with a saturated solution of mercury; after this, and without washing, I gave it a dose of iodide of potassium. In a second, the plate, as you may suppose, presented a most hideous appearance—yellow and orange colour on the surface, and a thin, sickly colour looking through it.

"Be jabers! ye's done it now, sor!" quoth Pat, as he looked at the awful plate. I washed it under the tap, and, retaining hold of one corner, kept moving it up and down in the hyposulphite bath. As if by magic, the yellow and orange disappeared, giving place to a brown black; and, upon lifting the plate between me and the light, I was agreeably surprised to find a negative of extraordinary printing power. I now treated the other weak plates after the same fashion, with the same result. Two I got rather dense, but a few hours' immersion in the alum very soon reduced them to the required depths. Clean, vigorous prints, and a good order, repaid us for all our annoyances at the photographing of Captain Mulligan's horses. At the same time, I do not yearn for a high, dry wind when I next go out upon such an errand.

AN UNSUSPECTED CAUSE OF THIN IMAGES WITH THE FERROUS OXALATE DEVELOPER.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

I have been troubled during the last day or two with thin images on gelatine plates when developed with ferrous oxalate developer, and I was anxious to find out the cause of it, since the same plates at other times gave vigorous images with plenty of detail in the shadows. The only thing which could be at fault was the developer. After examining into the matter, I found that the developer used had been exposed for some little time to the air in an open bottle, and the ferrous salt must have become converted to the ferric salt to a considerable extent. The question then arose as to the reason why such a developer should give a feeble image. It struck me that it might perhaps be the diminished strength of the developer, which is the reason usually given for it; but I was not satisfied that such could be the case, and it was necessary to test the accuracy of the suspicions I had. My suspicions were that the ferric salt probably might destroy the image instead of developing it, and if it destroyed the image, it might also attack the metallic image formed, and not only make the plate appear less rapid, but also induce feebleness. Some ferric oxalate, made as neutral as possible by adding ammonia till a precipitate was caused, was prepared, and experiments made with it. A gelatine plate was exposed, and drops of the solution sprinkled over it. It was then washed and developed as usual, with the result that where the ferric salt had been dropped, the plate refused to develop at all—the image on those parts had been totally destroyed. A glass plate was then silvered by the ordinary silvering process, a film of metallic silver of moderate opacity being deposited on the glass surface. A few drops of the ferric salt were placed with the aid of a glass rod on the silver, and almost simultaneously the metal appeared to dissolve away, leaving a highly transparent blue-violet film on the glass. The ferric oxalate had evidently thus attacked the silver. The plate was carefully washed and examined. What was the bluish transparent film? A drop of sodium hyposulphite at once dissolved it, so evidently a salt of silver was formed. Could it be made amenable to development? A fresh solution of ferrous oxalate was prepared and applied. The effect was instantaneous, for the once transparent film at once darkened, and metallic silver again made its appearance, the opacity being precisely what it had been before the ferric salt had been applied. The ferric oxalate evidently acted as Mr. Warnerke has recently shown the ferric sulphate does, viz., attack the silver image. What is formed is in all probability silver oxalate in the one case, and silver sulphate in the other; the one is insoluble in water, and the other slightly soluble.

A solution of ferric citrate was next made, and applied to the film in a similar manner; and its behaviour to the silvered plate and the undeveloped image was exactly the same as the oxalate salt.

If now we apply this to the case in point, we have an explanation of the thin image produced in the plates to which I have already referred. The ferric salt undoes the work done by the ferrous salt on the image, and we have as a result a want of density. The same explanation holds good for the feebleness of the image produced by a weak developer. As fast as the image is developed, a certain amount of ferric oxalate is produced, which soon bears a measurable proportion to the ferrous salt, when the amount caused by the actual development, and by the access of air, is taken into account. There seems to be no doubt. then, that ferrous oxalate, to be used with the best results. should be unoxidized, and this can only be caused by fresh mixing, or by keeping it under some liquid like paraffin, as Mr. Warnerke suggested. I am an advocate for preparing the ferrous oxalate by the old method (using the ferrous oxalate, and not the ferrous sulphate), and if, when so prepared, it be kept hermetically sealed, no bad consequences will ensue.

The results I have described, in no way shake my faith in it as a developer, as to my mind it gives more brilliant images than any other.

◆

At Home.

AT THE PREFECTURE DE LA POLICE IN PARIS.

A stone gateway, with a red flag drooping over it, is pointed out to us as the Préfecture. The armed sentry in front asks no questions, so we pass on under the arch into a cheerful courtyard smoothly asphalted. We bear a long, official-looking document by way of introduction, and this we keep ready to hand, lest some sudden attempt at arrest be made, before there is time to show our credentials. Fortunately there is no fear of this. A policeman in the courtyard barrs the way for the first time; but he is anything but a dangerous character. He is disposed to be argumentative, though, and in the end gets very excited over the address on the letter. It is for the chief of the Paris detective department, but unfortunately the name has been written with a *y* instead of an *e*. We point out that probably this will make no difference—it is the same thing. "But it is not the same thing," is the hot reply. "Cet y grec, la,—what does it mean?" As he taps at the "y grec" excitedly, we carefully look at it again, but can afford no other explanation. "Dites donc, M'elle," says the policeman, turning to a young lady who is busily sewing at an open window in the courtyard, "Have the goodness to look at that letter." The young lady reads the address, and thinks it is all right. "Mais cet y grec," responds the guardian of the law, still warmly. The young lady calmly thinks with us that it does not matter much, and in these circumstances the policeman gives the point up, and permits us to proceed.

Upstairs to the top of a lofty building, and we enter an ante-room, where several stern-faced men, clothed from top to toe in sombre black, are sitting at a table. We perform our best bow, and present our credentials. No one makes an observation, but we are carefully scanned, and then ushered into a salon, and the handle turned upon us.

It is a salon comfortably furnished, the chairs and settees uniformly covered in dull, green cloth. There are no nick-nacks beyond a clock, which ticks solemnly. The walls are bare; the sideboard is bare; but on the table are two solitary objects, an inkstand and a little bowl of sand, for the instant drying up of writing, so that you could be sent to the Bastile—if there were one—on the spot. Time goes on, and we wait a good half hour by the clock in the salon vert. We begin to wish we had read that letter of introduction before we presented it. "Lock up the bearer," or "The gentleman being rather inquisitive, keep him for the morning and let him go," might have been inside. We have plenty of time to think over the insanity of practical jokes, and the silliness of some people who continually practise them.

Presently the door is opened, and one of the solemn black greffiers beckons us. Without a word we follow him down one passage and up another, until he throws open a door, and we are in the presence of the chief of the Paris detective police.

A courteous gentleman, still young, with a smiling face and friendly manner, we find him, this head of the secret machinery of the gay capital; he is good enough to place himself entirely at our disposal. "I will accompany you through our photographic establishment myself, and you shall see everything that interests you."

He is as good as his word. He puts on his hat, and leaving word with one of our former solemn gaolers that he is gone to the photographic establishment, accompanies us down several flights of steps. We cross a yard, and perceive through an open door the dark forms of policemen, ready armed and accoutred, lying at full length over the floor in various attitudes. "La poste," explains our friend—it is a force ready to turn out for duty at any moment. We reach at length the basement of the building. Here all is prepared for our reception; we had evidently been kept waiting until the rooms were put into applepie order. An officer of the rank of inspector of police, under whose direct charge the rooms are placed, receives us, and in his company we proceed to make the inspection.

This is the mounting and finishing room, and here are batches of prints—carte size—ready for issue. Let us look at this double row of portraits on the table, first of all; they are copies. and taken obviously from portraits more or less good. They are of men, some of them old, and some very young, habited in ordinary dress, and for the most part very untidy about the hair and beard. There is not the trace of a razor among them. Hairy individuals, who have an aversion to the barber, and whose features would evidently be improved by the lavish application of yellow soap, they are most of them, the counter-parts of whom may be seen every day in the back streets of Soho. "Nihilists," the chief briefly explains.

Affairs in Russia have made European Governments extra cautious about the unsoaped and unshaven of the community; and this collection is the result of extensive research by the police of Paris.

"Enfants perdus," explains our friend a second time, for we have taken up some pictures of children who seem innocent enough. These portraits are exceedingly useful in trying to find out parents; the police carry the pictures into any quarter in which the children are likely to be known, and show them about. Photography has been found a most efficient aid in restoring children to their parents, or rather in discovering the whereabouts of those who have deserted their offspring.

These pictures are scarcely so attractive. The dull look of remorse borne by most of their sad, still faces, is terrible; they are portraits taken at the Morgue, where all unknown dead bodies found in Paris are carried. A large number of copies are printed if foul play is presaged, but every unknown body is thus recorded.

This heap of untrimmed and unmounted portraits of men and women represent the daily takings of the Paris police. They will be mounted, sorted, and presently put upstairs in the Record Office. They are ordinary persons enough, the sitters, of a low class most of them, but with nothing at all to show they are criminals. As portraits they are admirable, however, and we may at once say that the work at the Préfecture is simply very good indeed. The manner of proceeding by the Paris police is as follows:—Everyone charged with crime or misdemeanour of a grave nature, who is brought to the Préfecture, is photographed forthwith. It does not matter whether in the end he is proved innocent or guilty, he is taken to the studio, which is situatad in the same block of buildings as the court. As the prisoner quits the court he is at once brought before the camera. On an average, forty to fifty portraits a day are taken, and these are forthwith printed; some few may afterwards be cancelled, where innocence is manifest; but if there is the least suspicion, the portrait is pigeon-holed; it may be difficult to take the likeness a second time. In this country, as most of our readers know, it is not permitted to photograph an unconvicted person. Gelatine, by the way, has not yet found its way to the Préfecture; as the portraits are only carte size, however, an exposure of five or six seconds usually suffices.

The French portraits are certainly more valuable than our own. The men and women in Paris are pourtrayed as they usually are in everyday attire and with all their peculiar personalities about them, as to manner of wearing hair, beard, &c. Most of our portraits, on the other hand, depict the men shaven and shorn, in the grey convict dress, and therefore as they are never likely to be seen outside the prison walls. In France the governors of prisons care little about the appearance of their charges; it rests with the detective and police department to look after criminals at large, and these authorities, to assist themselves, prefer to have portraits of the men and woman as the latter are seen every day in the streets.

We go upstairs into the Record Office. There are two huge presses, containing in all the portraits of 40,000 bad characters. In one press are portraits arranged according to names, in the other according to crimes. In deep pigeon-holes fit long, narrow trays, full of cartes-de-visite. Each tray measures about two feet in length, and when slipped into the pigeon-hole, it shows on its outward face certain letters of the alphabet. The first is marked A—A M, and it contains portraits of criminals whose names begin with these initials. The cartes are loose in the long box, but all in order, so that a man or woman may be picked out at once. Here, in the other press, the pigeon-holes are divided into groups, over each being the nature of crime, such as *assasinat*, *vol*, *expulsés*, *mœurs*, &c. The chief, at random, takes down a long box of the *expulsés*, or banished ones, and looks them through. We divine what he is doing. Out of compliment to ourselves he is trying to find an Englishman among them, but his search is in vain. Italians turn up without number, and Austrians and Russians, but no English. We suggest that the search is impossible—there are no bad Englishmen. "Attendez," says the inspector, and he goes to work at another box. But *chef* and *sous-chef* are equally unfortunate, and in a few minutes laughingly give up the job. The name and other particulars are scratched on the negative, so that they print in black upon the portrait, and are quite inseparable. This is a neater and better plan, we think, than chalking the particulars on a black-board and photographing the latter with the convict, the plan adopted in Great Britain.

Another feature in the photographic establishment is the enlarging of handwriting, to establish, if possible, indentity of character between an acknowledged hand and that upon a spurious document. Here is a name written across a receipt-stamp enlarged ten or twelve times; there is no difficulty about examining the giant up and down strokes in every particular. If any writing is characteristic of a man, the character comes out in a marked manner as soon as enlargement takes place. Any slight spluttering of the pen in making an upstroke, or any particular flourish or defect about certain letters, is at once detected. On the walls of the Record Office are many examples of enlarged handwriting, which have served to discover forgery, and of which the police-photographers are very proud; they attach, indeed, exceeding importance to this feature of photographic detection.

The printing room and the washing room offer little of importance; they are well arranged, exceedingly clean, and judiciously appointed. But before taking our departure, the chief invites our attention to the photographic carriage, which is a valuable item of the establishment. It is a fine vehicle, painted black within and without, about the size of an ordinary police van. It is fitted as a dark laboratory, with sinks, shelves, handy seats, and all conveniences. In cases of fire, murder, and serious crimes, a view is taken of the scene or surroundings, and if a body is found under suspicious circumstances, a photograph is taken on the spot, if possible, before the body is tampered with. It is to perform duties of this description that the van is made use of; and such importance does the Préfecture attach to photographs secured on the spot, that it did not hesitate to spend a sum of 7,000 francs on the vehicle. On the whole, the police photographic establishment at Paris is most complete; and it is not only a model establishment, but one that has not its counterpart in any other country.

The "Bye-the-Bye" next week will be "Work and Wages;" the following "At Home" will be "At the Royal School of Gunnery, Shoeburyness."

A METHOD OF ESTIMATING THE SOLUBLE BROMIDE CONTAINED IN A GELATINE EMULSION.

BY W. K. BURTON.*

The method depends upon the fact that nitrate of silver will more readily combine with a soluble bromide to form bromide of silver than with a soluble chromate to form chromate of silver. As the accuracy of the result depends upon the close observance of a red or orange colour, the determination, for which a small portion only of the emulsion is used, should be made in daylight.

A certain quantity of the emulsion to be experimented on—say an ounce—is carefully measured out. This is diluted with several times its bulk of hot water, so that it may not readily set again. A certain quantity of chromate of potassium solution is then poured into the emulsion. The exact amount does not matter. It should be sufficient to give the whole a very slight yellow tinge.

A carefully standarised solution of nitrate of silver is now dropped from a graduated burette into the emulsion. At first, if there be any soluble bromide present, the red colour, which is produced by the formation of chromate of silver as each drop falls, will disappear on stirring the mixture. This is because the nitrate of silver has combined by preference with the soluble bromide; but when the whole of this latter has been used up the red colour will remain constant. The exact amount of nitrate of silver used when this occurs must be noted, and it is an easy matter to calculate how much soluble bromide was present when the operation began.

Should silver nitrate be in excess in the emulsion, this will be made evident by a deep red precipitate the moment the potassium chromate is added. Sufficient of this latter must be added to convert the whole of the nitrate of silver present, when its amount may be estimated by dropping into it a standarised solution of any soluble bromide till the red colour disappears. Very exact results may thus be obtained.

The colour of silver chromate is exceedingly intense. So intense is it, that if an emulsion containing only three or four grains of the chromate to the ounce, and taking only four or five grains of the nitrate of silver to its composition, be spread on glass, the result is a deep ruby film, which would, I believe, be very useful as a non-actinic medium. The amount of silver required is so small that this makes a very cheap coating.

The emulsion may be made as follows:—

Solution No. 1.

Gelatine	... 100 grains
Water	... 4 ounces
Bichromate of potassium ...	... 20 grains

Solution No. 2.

Nitrate of silver	... 20 grains
Water	... 1 ounce

Soften the gelatine in the water, add the bichromate of potassium, and heat till the gelatine is melted and the bichromate dissolved; then add solution No. 2.

This gives a considerable excess of bichromate, and I do not see that it is either necessary or desirable to wash this out.

---

* A communication to the Photographic Club.

Notes.

The Queen has a studio at Windsor constructed specially for taking photographs of the Royal Family and Royal visitors. Unfortunately, in the attempt to do the thing well, it has been made too large and too lofty.

Gelatine, glycerine, and tannin mixed together forms, according to M. Potal, a compound similar in its behaviour to Spence's metal. It is melted at a low temperature, but, nevertheless, sets very hard. If zinc white or sulphate of baryta is added, an ivory-like mass results, which might possibly be employed by photographers as a permanent or temporary basis for carbon pictures.

A curious reaction was noted at Berlin the other day. A feather dyed with methyl-violet was inadvertantly put upon a sheet of paper that had absorbed ammonia. The ammonia vapour caused the feather to become green, the green changing subsequently to a violet. The action of ammonia thus discovered is now being utilised by colour manufacturers.

Photography and the drama. We mentioned the other day that Mr. George Grossmith, the comedian, was not long ago a clever photographer. Another well-known name on the stage, Mr. Lionel Brough—who, by the way, is shortly to undertake the management of the Royalty Theatre—was also, once upon a time, a student both of photography and chemistry. Mr. Toole can boast of having pursued photographic operations in the biggest glass house ever built, to wit: the Crystal Palace.

A correspondent who has considerable experience in retouching upon gelatine, writes:—"The best medium for retouching—and I have tried many—is the 'Autotype." A little taken on the tip of the finger is smeared on thinly over the part to be pencilled, and allowed to remain an hour, which may be lessened by gently warming. After working with lead-pencil or brush, heat thoroughly, and varnish with any thin varnish. I often print without varnishing; still, it is better to protect the film."

Ferric salts rapidly attack metallic silver, especially when the metal exists in a porous state, as in the photographic image; and Captain Abney contributes an interesting article this week, in which he demonstrates the fact that the old oxidised oxalate developer is a two-handed weapon, the ferric part destroying the image, while the ferrous part builds it up.

Pawkins does not go in for the æsthetic when he describes the beautiful. Sitting the other evening under an emerald-leaved walnut tree, with the rosy heavens before him, and the glowing sun dipping into a lake of gold, he exclaimed: "That's a good-looking sky, that, and you see it to rights, too, under this handsome tree; the sun is as red as a pickled cabbage, and warms you like the kitchen fire." We are not so sure that a little of Mr. Pawkins' might not be welcome just now; he might found an anti-æsthetic society with advantage.

The growth of trees is just as inherent a sign of a particular climate or region as the race of men and women that inhabit it. And yet no one seems to have deemed it worth his while to make comparison of trees from various climes in the same way as human beings have been compared. The idea is not ours, but that of the Autocrat of the Breakfast-Table, who points to the photographer to undertake the work. Here is an example: "The American elm is tall, graceful, slender-sprayed, and drooping, as if with langour; the English elm is compact, robust, holds its branches up, and carries its leaves for weeks longer than our own native tree."

The gentlest and most delightful of American poets even tells the photographer how to proceed:—"The same camera should be used—so far as possible—at a fixed distance. The photographs should be taken upon the same scale of magnitude"; and "a dozen portraits with lively descriptions," Oliver Wendell Holmes thinks, would include the principal American trees. "If my plan were carried out," he says, "and another series of a dozen English trees photographed on the same scale, the comparison would be charming."

There are many landscape photographers in our country thoroughly competent to carry out this idea with taste and effect, and there could surely be no difficulty in finding an American brother ready to work in harmony. Photography is peculiarly adapted to the task, and we hope that if any gentlemen can be induced to undertake the labour, they will send the first results to the hale projector thereof—Dr Holmes.

The *Engineer* says that Japanese cement, which is white and almost transparent, and, therefore, not unsuitable for mounting, is made by mixing powdered rice with a little cold water, and then gradually adding boiling water, until a proper consistency is acquired. The mixture must be kept continually stirred the while, and finally boiled for one minute in a clean saucepan, to prevent any chance of acidity.

Another simple plan to produce an ivory material is, to to make isinglass and brandy into a paste, with powdered egg-shell, very finely ground. The mixture may be coloured with any desirable pigment. In casting, the mould should be slightly warmed and oiled.

On Sunday night we had an opportunity of seeing Craigmoor Lighthouse, the only light in the United Kingdom that has intelligence enough to tell the mariner its name. It is an experiment of Sir W. Thompson, whose idea it is that every coast light should not only warn sailors, but tell them where they are. Craigmoor signals C every minute, that is, it winks four times, which means the same thing in the Morse language. Watching it from our window far into the dark night, it seemed the only living thing, as it winked at regular intervals, and appeared to say, "I am awake, I am; my name is Craigmoor."

Topics of the Day.

SUBTERRANEAN PHOTOGRAPHY.

BY J. STREATFEILD COX.

At the foot of the Mendip Hills, about eight or ten miles from the city of Wells, and just at the entrance to the most remarkable pass in England, is the Cheddar Cave. My first attempt to photograph the interior was made a long time ago, when nothing quicker than a wet collodion plate was known, and my experience went to show that the best favoured collodion plate would dry (and crack, for that matter) before it had received sufficient exposure. Nothing, therefore, came of those attempts, unless one reckons the oxy-hydrogen gas, purchased twenty miles away from home, and brought in a bag, half leaked out, and the nice clean plate that no trick of development would permit the ghost of an image to appear upon after exposure.

All must now admit that times—photographically speaking—have altered, and with the quick gelatine plates of to-day, what may you not do?

The whole of this cavern is lighted with gas; but before we attempt to make a picture, let us look round upon the weird beauty of the place. There are some five or six chambers, each differing from the other, and each graced and draped with Nature's water sculpture, grotesque and picturesque, the carbonate of lime formations taking every conceivable shape and hue, and where the stalactite, hanging in wavy folds, weeps eternally upon its counterpart, the stalagmite, rising from the floor to slowly but surely meet in one long column; here would I gladly plant my camera, but must forbear, for the light at my command would need to be ten times as much as it is to "get in" half its beauty.

The part best suited for my attempt was where the original floor of the cavern is now breast high, and you look through to the chambers beyond. This part of the cavern is exceedingly beautiful, and I was able to light up the whole in a very satisfactory manner.

> Here you behold the tiara and cope,
> Perchance of some antediluvian Pope,
> And the flanged sides of his cryptic cell
> Respond to the touch like cathedral bell.
> And the elegant font his temple adorning,
> May have served at the birth of this beautiful earth,
> When together sang the stars of the morning.

But to business. From the gas that is laid on in the cavern I utilized thirty lights—ordinary fish-tail burners—and the addition I made to them was the use here and there of four ordinary paraffin lamps. From the tin-shop in the place I obtained two large pieces of bright clean tin, the use of which I need not explain. This was all the light I had, except such light as a friend who accompanied me occasionally threw upon the matter in hand. It was arranged that the gas being set on, and the lamps put in position, we should both assist, by holding the pieces of tin before mentioned in such a position as should throw additional light upon the subject, or rather upon those weird formations that have no likeness in the heavens above or the earth beneath.

I used a Voigtlander portrait lens, no stop, being careful to tie up the slit whence the stop came, to exclude extraneous light. The time of exposure I had fixed, and things went on swimmingly till within a short time of capping the lens, when an idea suddenly struck my friend that he could improve matters materially, and from his position on one side, turned round, and with his glinting piece of tin sent a flood of light right into the lens. How singularly gifted your amateur friend always is! To do without the assistance of mine in the dark room, I gave him a back number of the News, pointing out to him Mr. Dixon's way of photographing lions and tigers to read. As it may be supposed, I soon appeared with a fresh plate in the slide, and we both proceeded silently to have another try. It was about 10 p.m., most bitterly cold, with a wind that seemed to literally go through you. On our way, my clever friend said, "I know why that last picture was a failure; it was not the bit of light I put on. I have read that paper you gave me, and now I know the cause"—'the wind is in the east.'"

Here was a staggerer! There is a certain old gentleman of my acquaintance, not easy to get on with at the best of times, but when the wind is in the east, I fear to go near him. Then I thought of the lions and tigers—nothing to be done with them when the wind was in the east; and if lions and tigers, why should not stalactites and stalagmites refuse to be pourtrayed when the wind is in the east? So, without answering, I superstitiously protect the slide as best I can, and wonder what crime next will be laid at the door of the east wind. We are soon out of it, however—I mean the east wind—and the sudden change from sundry degrees of frost outside to a thermometer standing at 54° in the cavern is just the thing to make one feel comfortable and hopeful.

A really good idea comes to my friend at last (as if to make amends); he not only suggests, but carries out the fixing up of those pieces of tin—an idea I thank him heartily for.

Now, ten minutes by my watch, and away to the dark room. Pyrogallic and ammonia, both mixed first, and applied to the plate without any previous wetting; and never has a gelatine plate "come up" better in my hands. To say I was pleased is saying very little indeed, although I know my negative is not perfection. It was a portrait lens; there was no stop; the sides of the picture suffer in consequence. I looked at the ground glass with a large size stop in, but I was frightened, and took it out. All the water I use in my small way of photography I get from the cavern—it is very pure. Somersetshire's poet, Outis, whom I quoted just now, says the stalactite forms at the rate of the tenth of an inch in a thousand years; as a matter of fact, forty years of dropping has made no appreciable addition; hence there can be very little carbonate of lime in water I use.

The science of photography is certainly striding on apace, since it allows one even to go into the bowels of the earth, and bring therefrom records of its hidden works and beauties.

The "Topic" next week will be "On Washing Emulsion," by Dr. J. M. Eder.

FRENCH CORRESPONDENCE.

Printing with Gelatino-Bromide through the Thickness of the Glass, and from the Back of the Paper—Other Applications of Mr. Warnerke's New Process.

Printing with Gelatino-Bromide through the Thickness of the Glass and from the Back of the Paper.—A most interesting application of the process recently described by Mr. Warnerke would be that of producing prints from the gelatino-bromide plates through the thickness of the glass or of the paper. In this way we should be able to dispense with the transfer of the image in order to fix it by means of hot water. It would be possible to act directly on the plate by exposing it in such a way that the layer of gelatino-bromide might be on the side turned towards the outer flap of the slide. The focus would, of course, be regulated so as to fall on the plane occupied by the sensitive surface. This surface would therefore be affected by light reflected through the thickness of the glass, and when the image has been developed by pyrogallic acid, it is only necessary to place the plate (having first dried it) in hot water, in order to remove at the same time both the gelatine which has remained soluble, and all the silver compound which has not been reduced. It will then be found that the image would be reversed, and if it is desired to have it in the regular order for ordinary printing, it would become necessary to use plates which had been first rubbed with talc, then collodionised, and finally coated with emulsion. So soon as the fixing by hot water is finished, the plate must be left to dry, the outer surface must be collodionised, and the pellicle could then be drawn off, and could be used on either one side or the other, as might be desired. For positive prints it is possible, by employing very thin and transparent paper, to take direct impressions on the paper, without having recourse to a transfer of the image; the back of the paper only need be exposed against the negative. The image would be formed at once by contact, and after developing and drying, there will be nothing more to do than to plunge the paper into hot water; everything not belonging to the image would in this way be removed.

Other Applications of Mr. Warnerke's New Process.—In certain cases it may be of great advantage to thus apply the remarkable process with which Mr. Warnerke has lately enriched our art. I do not know whether in this method of exposure through the thickness of the glass or of the paper the advantage described by Mr. Warnerke, of impossible over-exposure, will be preserved, but the subject deserves a closer investigation, and this investigation I mean to undertake. Of course it will be necessary, in the case of printing through the thickness of paper, or still more of a pellicle of collodion, to use very thin supports in order to avoid diffusion of the luminous rays. In the case of the reproduction of line subjects, it would be possible to work directly by contact on a thin film of gelatino-bromide. If the negative is very opaque in the ground, we should be able to over-expose—that is to say, to cause the light to penetrate the whole thickness of the sensitive film—and the fixing could take place directly without our being compelled to have recourse to a transfer. We could in this way take copies of great vigour, by making use of the intensifying process by means of some colouring material as described by Mr. Warnerke. As he rightly says, "The great rapidity which is thus obtained permits us to make an immense number of applications of the gelatine processes, such as the carbon process, the relief for Woodburytype, plates for collotype, positives for projections, &c., which we could only succeed in effecting very slowly on bi-chromatized gelatine. In this process we may succeed in founding quite a new method of carbon printing, altogether overthrowing what has been up to the present accomplished in this difficult path; as is well-known, the earbon process has now been abandoned for taking small prints. I foresee the dawn of a new carbon process which will exceed in rapidity, in softness, and in regularity everything which has been done up to the present by the old method.

(*To be continued.*)

GELATINE JOTTINGS.

BY A. COVENTRY.

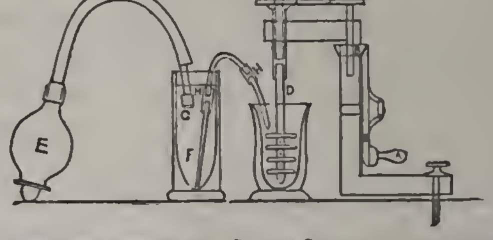
The preparation of the plate resolves itself into four operations:—1. The cleaning of the glass. 2. Preparation of the emulsion. 3. Coating with emulsion. 4. Drying.

To clean the plate, the elaborate care which we had to bestow on the glass when the silver bath was used is quite unnecessary. The glass must be free from mechanical impurities and from greasiness, and in most cases breathing upon it, it near, and polishing with a clean cloth, is all that is required.

The preparation of the emulsion is the main difficulty we have to contend with, but this becomes very simple if the principles involved are correctly apprehended. It resolves itself into three operations, namely, mixing the solutions to form the bromide of silver; cooking to render the emulsion sensitive; and the elimination from the emulsion of the free salts. If we make up an emulsion by adding a solution of nitrate of silver to a solution of gelatine containing bromide of potassium or ammonium, we obtain a compound which is only slightly sensitive to light, but which by the prolonged action of heat ultimately arrives at a very exalted sensitiveness. A further prolongation of the cooking decomposes the gelatine, and the mixture becomes worthless. This fact, discovered by Mr. C. Bennett, was the "missing link" the finding of which brought gelatine emulsion within the sphere of practical photography. Dr. Monckhoven next discovered that ammonia very much hastened the action of heat, and rendered it possible to attain the same sensitiveness in a very much shorter time than the five to seven days at first deemed necessary, and Dr. Eder showed that the continued application of heat decomposed the gelatine and led to the liberation of ammonia. We therefore have two agents which we may use to render the emulsion sensitive—heat and ammonia; and these are required to overcome the retarding action of the gelatine. It therefore follows that we may shorten the cooking process either by reducing the quantity of gelatine used in making the emulsion, by increasing the quantity of ammonia, or by a combination of both methods.

The plan which is most popular—in which as little as two grains of gelatine to the ounce of emulsion is sometimes used, and sensitiveness attained by boiling for from ten minutes to half-an-hour—is an illustration of the first method. Dr. Eder's formula, in which he uses ammonio-nitrate of silver, is an example of the second plan; and that suggested by our worthy member, Mr. R. Atherton, and used by myself and many of our members, illustrates the combination. About six grains of gelatine to the ounce of emulsion are used in this formula, and five minims of ammonia, the heat not being allowed to exceed 100°.

Fig. 1.



Apparatus for Introducing the Silver Solution into the Bromised Gelatine.

The handle A being turned, transmits motion through the hind wheels B B, and pulleys, C C, to the spindle D (this is of vulcanite, with glas stirrers), and agitates the gelatine. The enema ball, E, being squeezed forces air into the vessel, F. The pressure being retained by a valve at G the air pressure drives the silver in a fine stream into the gelatine. H H are pure rubber connections.

In the formation of an emulsion the object we strive for is to precipitate the bromide of silver in as fine a state of subdivision as possible. This is not a matter of difficulty where a large proportion of gelatine is present; but the more we reduce the quantity of gelatine the more delicate does the operation become. A high temperature also increases the difficulty; it is, therefore, best to mix at a temperature not exceeding 100°, and to introduce the silver solution very gradually while the bromised gelatine is kept in a state of agitation. Various mechanical methods have been devised for accomplishing this purpose, one of which I have on the table, and which has been shown and explained at a previous meeting. Our great enemy is fog, and we best contend against it by mixing our emulsion at a low temperature, and exercising great care not to introduce the silver solution too quickly.

The elimination of the free salts may be effected either by dialysis, by washing the solid emulsion after breaking it up into small fragments, by precipitation with alcohol, or by insertingthe solid emulsion in water.

The method I invariably use was first suggested to me by Mr. J. Young. The emulsion is allowed to set in a thin film, one-eighth to three-sixteenths of an inch thick, in a suitable plate or dish, and is then immersed, gelatine downwards, in a pan of water, with sufficient water below it to dissolve out all the salts. The water permeates through the gelatine, and the salts fall to the bottom of the vessel. Mr. Young tells me that an hour is sufficient to effect this, but I usually give about twelve hours.

Of the following, I very much prefer the formula No. 3, and find less liability to the yellow stain under prolonged development when a chloride is present in the emulsion.

---

* Read before the Manchester Photographic Society.

No. 1.

Ammonium bromide	13 grains
Gelatine	6 „
Water	2 drachms

No. 2.

Ammonium bromide	12½ grains
Potassium iodide	½ grain
Gelatine	6 grains
Water	2 drachms

No. 3.

Ammonium bromide	11 grains
„ chloride	1 grain
Potassium iodide	½ „
Gelatine	6 grains
Water	2 drachms

All the above are to be used with—

Nitrate of silver	20 grains
Water	2 drachms

When mixed, five drops of fresh liquor ammonia are to be added, the temperature being 95°, and the emulsion is then covered up with a tea cosy in its water bath, and cooked from fifteen to thirty minutes according to the sensitising time required. The emulsion is now shaken up and poured into a suitable kitchen plate or dish, and left to set.

I have used Nelson's special gelatine almost exclusively, and find it most reliable and free from any tendency to blister. The quantity of gelatine recommended, viz., six grains, is sufficient to set firmly; and it is easier to eliminate the salts perfectly when the whole of the gelatine is not present during the process of washing.

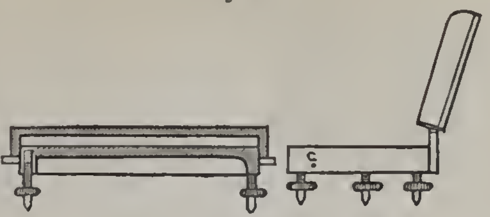
I usually perform the operations up to this point over-night. In the morning the emulsion is set hard, and before going to business is immersed, face downwards, in a bucket of water, where it remains till the evening. It is then scraped off the plate and melted, and fourteen grains of gelatine, previously soaked in water and melted, are added. If this do not bring up the volume of the emulsion to the required quantity, water is added to make it up, and half-a-drachm of alcohol containing half-a-grain of salicylic acid. The latter may be conveniently kept mixed in quantity. The salicylic acid preserves the emulsion if kept for several weeks, and checks the tendency to increased rapidity which the emulsion shows as decomposition progresses.

The emulsion, being now complete, should be kept at a moderate heat (about 120°) for an hour, and shaken up at intervals so as thoroughly to blend the fresh gelatine with the thin emulsion. It may then be bottled off into bottles of suitable size, and kept for use as required, or may be worked off at once, but must be first filtered through wash leather which has been previously made porous by washing in warm water containing a small quantity of washing soda, and then in several changes of clean water. A convenient plan of making a filter of this material is to prick a number of holes, about half-an-inch apart, round the edge of a circular piece of the leather, and thread through the holes a piece of brass binding wire. After use, this can be washed and squeegeed out like a sponge. The wire is not stiff enough to resist the squeegee, but still, when pulled into form again, keeps the filter its proper shape. The plate, slightly warmed before applying the emulsion, is held on a plate-holder, and a measured quantity of the emulsion applied by means of a ladle of the exact capacity—the ladle being used to guide it over the plate—and then returned to the emulsion. For quarter-plates a salt-spoon answers admirably, and for 9 by 7 plates a dessert spoon, the handles being bent upwards to a convenient angle.

It is advisable to make only a few plates at first from each batch of emulsion, and to test them for rapidity and freedom from fog—for rapidity, on account of the difficulty of making each batch exactly of the same degree of sensitiveness. A convenient method of testing for rapidity is furnished by Mr. L. Warnerke's sensitometer plates. My standard plate at a distance of two feet from a sperm candle three-quarters of an inch in diameter, with an exposure of forty seconds, shows No. 20 when developed with a standard developer. To arrive at this exact figure the first batch of emulsion is tested and labelled; it gives, say, No. 10. A second batch is prepared and cooked so as to give greatly-increased sensitiveness; it reaches, say, No. 30. These two emulsions mixed in equal proportions will give No. 20. By this plan we arrive at great regularity, and reduce the difficulty of calculating for exposure to a minimum.

The emulsion being spread evenly over the plate, it is placed on the levelling-plate (fig. 2) till set, and then transferred to the drying-box or cupboard (fig. 3). The drying should be quick. This is best secured by the air which enters the drying box being slightly warmed, and kept in continual motion by means of a long chimney to create a steady draught.

Fig. 2.

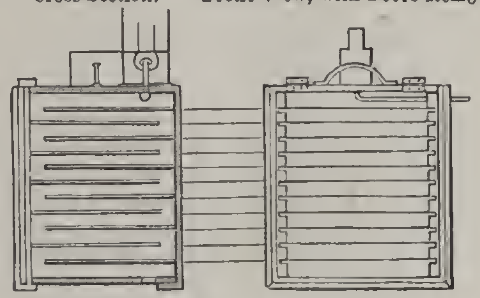


Cast Iron Levelling Plate.

It stands on three adjusting screws, and has a wooden cover hinged at the back and falling on to two pins, leaving a space of one inch between the plate and the cover.

Fig. 3.

Cross Section. Front View, with Doors Removed.



Drying Box.

The shelves slide in from the front. Each alternate one is stopped half-an-inch from the back; the top shelf is fixed and not used. There are two doors, the inner one hinged, the outer sliding in from the top with lip to cover up the joint. Air enters through a long slit at the bottom, and is drawn off at the top by a chimney—three inches diameter, five feet long—in which an argand or Bunsen burner creates a draught. The box stands in a tray, which may be lined with lead and filled with sulphuric acid.

A gelatine plate made from an emulsion in which ammonia has been used will not stand so much ammonia in the developer as one prepared by boiling, and requires more pyrogallic. The formula for developer is—

Edwards' pyrogallic	½ drachm
Water	1 ounce
Liquor ammonia	1 „
Bromide of potassium	80 grains
Water	2 ounces

Three drops of the ammonia solution are used to start development, and five more added to bring up to printing density.

A great deal has been written about the light which is best to work by. The little Davey lamp enclosed in the neck of a hock bottle forms a very safe light. Three of these placed in suitable position give perfect comfort in working, without any danger of fog.

Correspondence.

MR. WARNERKE'S NEW PROCESS.

Dear Sir,—I have been much struck with the great importance of Mr. Warnerke's communication regarding the several applications that may be made with gelatino-bromide exposed to light and developed by pyrogallic acid.

The interest I felt in the subject caused me at once to make some experiments with this new method of fixing the photographic image. One great difficulty encountered me at the outset. It was that of preventing the pyrogallic acid acting upon the gelatine, and causing the latter to coagulate, and to render it insoluble in warm water, apart from all action of light or developer.

If a sheet of paper covered with gelatine is half immersed in a solution of pyrogallic acid, and after washing is permitted to dry (or even without drying) is put into warm water, that portion of the gelatine surface which has been treated by the acid will not dissolve, while the rest, of course, dissolves at once. It is true that if the film of gelatine is thick, the action of the pyrogallic acid only renders insoluble a portion of the thickness, and in this case the warm water will dissolve the non-modified gelatine; but there will remain an insoluble pellicle. I presume that Mr. Warnerke must have found means of remedying this coagulation, for when a cliché is prepared with gelatino-bromide and developed with ammoniacal pyrogallic acid, there is formed upon the surface of the cliché a greater or less thickness of coagulated gelatine. This film when the fixing with warm water is proceeded with, remains adherent to the glass with the image, and preserves in its thickness the bromide of silver not attacked by light, hyposulphite of soda being necessary to dissolve it.

I thought it might be possible by means of paper, or thin transparent pellicle, to produce impressions through the thickness of paper, or even glass, in the camera, and I communicated this idea in my last letter. I must confess I was in error to develop an image which is impressed upon the sensitive compound through paper or glass; it is necessary that the developer act through the whole thickness of the film, in order to penetrate to the portions impressed by light. The entire mass is therefore rendered insoluble, and when it comes to fixing with warm water, nothing dissolves. Gelatine coagulated by the mere action of the developing solution swells more than that which has been impressed by light; but if the cliché is required to be transparent, it is necessary to fix with the hyposulphite. I can scarcely see, therefore, the way of utilizing this process, either for direct impressions, or for clichés which are not to be fixed with hyposulphite. Evidently Mr. Warnerke, whose skill and ability are so well-known, has vanquished some difficulty which has proved too strong for me. Will he give us further explanation, for in his paper he speaks of ordinary development with alkaline pyrogallic.

I should feel obliged if you would allow this letter to appear, especially as it contains the rectification of an error I myself committed. No doubt our excellent colleague Mr. Warnerke will vouchsafe a reply which will satisfy experimentalists by clearing away difficulties that beset their first essay of the new method he has published.—Faithfully yours,

Leon Vidal.

OVER-PRINTED PROOFS.

Dear Sir,—In your last issue I see there is account of a process for reducing over-printed proofs by means of a weak solution of cyanide of potassium by Mr. W. England. I published the same process some eighteen months since in a contemporary journal.—Yours truly,

William Brooks.

THE PUBLICATION OF PHOTOGRAPHS.

Sir,—I have read your excellent article on the above subject in your last impression, and venture, with your kind permission, to make a few suggestions by which photographers and others may have their works of art submitted to the public. It is now almost universally acknowledged that photography is one of the fine arts, and this being so, why should the profession be debarred from submitting their work to the public in conjunction with painters and sculptors? I have no doubt that there is a prejudice existing, and to remove it I recommend photographers to unite and establish an art gallery in Bond Street for their exclusive use; and you may be assured, sir, that when the general public have seen the work of such men as Payne Jennings, R. Faulkner, and others, they will appreciate and give their support to the same, and by this means the profession also publish their photographs. There may be some who will urge against such an institution; but I will endeavour at a future time to place some other facts before you which will strengthen the present suggestion. Thanking you in anticipation, yours obediently,

Charles Shmith.

Sir,—I was very glad to see in the recent article on "The Publication of Photographs," the following:—"The Exhibition in Pall Mall only requires to be directed with energy and *savoir faire*, and to be thoroughly well advertised, to make it one of the most successful shows in London. In the hands of a business-like manager, it might be made still more lucrative."

I fully agree with this, and have felt that some alteration from the present system was required. It is really depressing to walk into this Exhibition and see so few people, and no one there to answer questions or give information. The advertising, without which nothing at the present day will ever attract attention, should be thoroughly taken in hand. Instead of the three or four men lounging at the corner of Suffolk Street, there should be at least thirteen men promenading the principal streets at the West End—Parliament Street, Whitehall, Charing Cross, Strand, Fleet Street, Pall Mall, Regent Street, Piccadilly, New Bond Street, and Oxford Street—from 11 to 5 o'clock, with more "taking" placards than the mere bare mention that the Photographic Exhibition is being held. Then a short paragraph should be sent to the newspapers a day or two before the day of opening. The critics should also have a better opportunity of seeing the exhibits than is now afforded them at the crowded *soirée*. Why should they not be requested to see them the day before, or at least on the morning of the opening day, and still be invited to the *soiree?* I do not know what papers are requested to send representatives, but this, too, is important. Somebody also should be always in the room to take any possible orders from visitors. A man, or better, perhaps, a lady, of good appearance and manners, and especially of tact, is essential, and could do much even in the way of making unobtrusive suggestions. Lastly, the catalogue should not be rushed through the press, necessitating so many corrections, additions, and even alterations in the description of the exhibits. Perhaps at one of the "Technical Meetings" a good business plan may be adopted in anticipation of the next exhibition.—Yours truly,

A. B. T.

CHANGING THE COLOUR OF GELATINE IMAGES.

Dear Sir,—Gelatino-bromide negatives or positives may be aptly changed as regards colour by making use of silver chloride. The fact, it may be remembered, was published some years ago, that a gelatino-bromide negative can be changed to a brownish-yellow, and thereby intensified. If, after fixing, it is treated with a solution of chloride of copper, white silver chloride is formed, which, under the action of alkaline pyrogallol, is reduced to a brownish-yellow film.

The gelatino-bromide image, when converted into chloride (treatment in a mixture of bichromate of potash and hydrochloric acid is most advantageous), and washed, may, however, be developed with any chloride-of-silver developer, only, of course, the film must first of all be exposed to light. By employing any of the different developers for silver chloride specified by Pizzighelli and myself—see Photographic News, Nos. 1181 and 1183—different tints may be secured, as, for instance, a purple-red with hydrokinone. This method of imparting colour is capable of varied application, and might possibly be used for tinting or toning pictures produced upon bromide-of-silver paper.—Faithfully yours,

J. M. Eder.

Vienna, 26th May, 1881.

Proceedings of Societies.

Manchester Photographic Society.

The monthly meeting took place on the 12th inst., Mr. A. Brothers, F.R.A.S., presiding. The minutes of the previous meeting were read and passed.

The Chairman said he desired to call attention to a very important and annoying fact relative to commercial gelatino-bromide plates—that of unequally sensitive plates being packed in the same box, and sold by the manufacturers as uniform. In some boxes or packages he had found plates that were only ten times as quick as wet collodion mixed with others that were twenty times as rapid.

Mr. Jos. Lytle said he had purchased some commercial dry plates which differed in size greatly.

Mr. A. Coventry then read a paper on "Emulsion Experiences" (see page 260). He afterwards gave a practical demonstration of the process of preparing gelatine dry plates, and exhibited and described all the necessary apparatus.

Mr. Wm. Broughton exhibited an instantaneous shutter for stereoscopic lenses, and on the revolving principle.

Mr. Mallalieu exhibited an emulsifying can for hot water, apparatus for keeping the emulsion warm, and spreader for same

Mr. J. W. Leigh drew attention to the usefulness of the glass syringe for coating and spreading the gelatine emulsion in the preparation of dry plates. He also showed a gelatine plate intensified by the conversion of the image into a silver sulphide. The fixed negative is placed in a solution of chloride of mercury until it is bleached, then well washed and transferred to a bath of weak solution of potassium sulphide or weak sulphuretted hydrogen water, well washed, dried, and varnished. He advised the operation to be performed in the open air, or in a draught chamber.

Mr. John Chadwick said he had employed this method many years ago for toning stereoscopic transparencies. The colour obtained by its use was very beautiful, and if varnished afterwards they were durable and fairly permanent; but when not varnished they were subject to fade very rapidly.

Mr. Leigh, referring to the plate he was then exhibiting, said that to test its permanency he had cut it in two. One half he had carefully preserved, and the other he had subjected to all the sunlight they had had for a month, and he was unable to detect any difference in the two halves when brought together. The plate was varnished soon after developing.

Mr. Rishton stated that the method of intensifying he used, and strongly advocated was, after bleaching a negative with the bichloride of mercury, to immerse it (after well washing) in a saturated solution of hydrosulphuric acid, which converted the whole of the chloride of mercury and silver into the sulphides of those metals. The bleaching of the films by ammonia, he said, did not give much density, because the ammonia dissolved out the chloride of silver, which the hydrosulphuric acid converted into sulphide along with the mercury in the film Although much had been said about the fading of negatives that had been intensified with mercury, he (Mr. Rishton) said he had experienced this to his sorrow on more than one occasion, *when using other processes of mercurial intensification*; but he had not found the hydrosulphuric acid process, as above, to alter, *if the principles upon which it depended were adhered to*, viz., that the whole of the mercury and silver in the film be converted into sulphide. With regard to local intensification by that process, he said the method he adopted was to allow the bichloride of mercury to have full action on the film, and then to apply diluted hydrosulphuric acid (diluted to about one in seven) to the film with a dropping-tube or a large camel's-hair brush, keeping the negative about one-eighth of an inch under water, using a dish, and slightly moving all the time. After washing, he dipped the plate into a solution of ammonia, one to ten of water, washed, fixed, and dried. The process should be conducted, preferably, in the open air.

Mr. W. J. Chadwick observed that he had tried the pyrogallic acid and silver intensifier, as suggested by Mr. Leigh at the last meeting, and was very much pleased with the results.

Mr. R. Atherton said that, on this latter experience ence he had mixed up the necessary chemicals for his own use, but he was sorry to say that the results of his trials were utter failures; for in every case the film dissolved away and washed off in a few seconds. He suggested, in order to account for such misfortune, that his nitric acid was new and very strong.

Mr. A. Coventry stated that he had intensified gelatine negatives by pyrogallic and silver with acetic and citric acid.

Mr. W. J. Chadwick then exhibited one of Mr. L. Warnerke's actinometers, and also one of Mr. Woodbury's, describing their construction and use to the landscape photographer.

A long discussion on artistic photography followed, and

Mr. C. Pearson, Jun., proposed that a committee be appointed to consider the practicability of arranging a series of subjects and prizes to be competed for by the members. This resolution having been carried, a committee was appointed, consisting of Messrs. A. Brothers, F.R.A.S., C. Pearson, A. Coventry, John Holding, and W. J. Chadwick.

The Hon. Secretary then read the dates and names of the places fixed upon for the out-door meetings during the season as follows:—May 28, Haddon Hall (Bakewell Station). June 18, Bolton Woods (Skipton Station). July 2, Dunham Park (Bowdon Station). July 16, Ashford-in-the-Water (Bakewell Station). July 30, Prestbury (Prestbury Station). August 13, Texal (Whaley Bridge Station). August 27, Manley Hall and Park. September 10, Chadkirk (Romiley Station). Sept. 24, Belle Vue.

A cordial vote of thanks was passed to Mr. Coventry and the other members who had taken part in the discussion. Thus a very interesting and enjoyable evening was brought to a close.

The first out-door meeting of the Society for the present season took place on Saturday, the 28th inst., to Haddon Hall, Derbyshire. Twenty members and their friends mustered at the central station, for the one-o'clock train—where special arrangement had been made—and they were conveyed at a reduced fare.

Bakewell station: Here two wagonettes awaited their arrival, and they drove to the Hall. Several views of the grand old pile were secured from the meadows, with water and castle in the foreground. By arrangements previously made, members had access, and were admitted, to all parts of the place, and every facility and accommodation was given to them through the kindness of Mr. Swain, the steward in charge. In the evening the members partook of an excellent tea provided by Mrs. Swain. After 101 plates had been exposed—most of which were gelatine—the members left for the 8·11 train from Bakewell. Some took advantage of a wagonette, whilst others preferred to walk. A grand day, with a goodly company, made everybody enjoy himself, though regrets were expressed that more ladies were not present. Many members promised that at succeeding trips they would bring their wives, sisters, cousins, &c.

The next out-door meeting will be to Bolton Woods, June 18th, 1881, by train leaving Victoria Station at 9·30 a.m. Members intending to go should endeavour to drop a post-card to the Hon. Secretary three days before. Several of the members, having a desire to be there in the early morning, have already decided to go on Friday evening, the 17th of June. Any other members wishing to join the Friday evening party should communicate with the Hon. Secretary as soon as possible.

Liverpool Amateur Photographic Association.

The monthly meeting was held at the Free Library, on Thursday, the 26th ult., Mr. E. Roberts in the chair.

The minutes of the last meeting were read and confirmed.

Mr. W. Bruce proposed that the list of subjects for the competition pictures of the year be printed on the next monthly circular. The proposal was seconded by Mr. A. W. Beer, and carried.

Some discussion ensued as to the precise import of the words "still-life" in the list of subjects, and its was finally decided that the words need not be very closely defined.

Mr. Bruce gave a demonstration of his method of producing micro-photographic enlargements, and introduced the subject with the following observations:—"Ever since I commenced to work with the microscope I have had a great desire to photograph the objects I worked upon, which have been almost entirely *diatoms*, and these little shells are perhaps the best microscopic subjects to photograph. Very early in my microscopic career I got a book on photography, but the amount of apparatus required for the wet process somewhat alarmed me, and therefore I never attempted it. However, some three years ago, a friend told me of a new kind of dry plate which was coming into general use, and which struck me as being the very thing I required. I set to work soon after, and purchased an old half-plate camera and some gelatine plates With these and my microscope I commenced operations, and as I had no time during the day I used a lamp as the means of illumination, and I have stuck to this ever since. At first I simply put the microscope in a horizontal position, then put the eye-end (without the eyepiece) into the lens aperture of the camera, and made the joint as light-tight as I could. After this I screwed the object-glass in its place and adjusted the light and object. I found, after trying all kinds of condensers, that the best I could get was the simple bull's-eye condenser, with which every microscope is provided. I placed this at a suitable distance between the lamp and the stage of the microscope, so as to get the flame of the lamp to focus on the object. I did fairly well in this way; but I could only get the object of a very small size, although I used a quarter-inch objective. The largest circle of light I could get on the focussing-screen of the camera was about two and a-half inches. By making a very long camera, I partly overcame both these embarrassments; but then it was so difficult to work with that I gave the thing up for some time. The following winter, however, I again commenced using the A eyepiece as an amplifier, and found that although I lost a little in definition, it was very much easier to work and far more compact. With the A eyepiece, as I have it to-night, I get about the same amplification as I would with a camera five or six feet long, not using the eyepiece. I will now proceed to use the apparatus which I have thus hurriedly described.

The demonstration proved to be exceedingly interesting, and was successfully conducted throughout. The light employed was that of an ordinary microscopic lamp, the subject was a *diatom*, and the time of exposure on a rapid gelatine plate was about an hour. The development was conducted under the greatest difficulties, for the daylight streamed into the well-lit room, and no dark chamber was at hand. However, a large tin box placed upon its side, and its half-opened lid screened with great coats and other contrivances, enabled Mr. Bruce to develop a dense negative of the first class, and without a trace of fog.

A vote of thanks having been cordially accorded to Mr. Bruce for his excellent demonstration, the meeting proceeding to discuss the subject of an outdoor meeting for June. After some debate the spot chosen for the purpose was White Ladies' Abbey, in Staffordshire, and the day selected was the 2nd of June.

The exhibits of the evening consisted of a large number of mounted prints contributed by Messrs. Kenyon, Boothroyd, and Palmer, and the meeting was adjourned to the last Thursday in June.

Talk in the Studio.

By the kindness of Colonel Thynne, the Society for Photographing Relics of Old London has secured views of the interior of Ashburnham House, Little Dean's Yard, Westminster. They comprise the celebrated staircase and other beautiful features incorrectly attributed to Inigo Jones.—*Globe.*

Photography at the Polytechnic.—On Wednesday evening we looked in at the Polytechnic, in order to hear Mr. T. C. Hepworth's discourse, and see his illustrations. Some preliminary matters regarding the early forms of camera-obscura having been discoursed, the Daguerreotype and Talbotype were described. A glance at the principal points of the wet-collodion process now brought the lecturer to what he evidently regarded as the topic of the occasion,—the gelatino-bromide emulsion method, and its notable rapidity as compared with other processes. An enlarged image of a child's head was projected, by means of a small lime-light lantern, on to a sheet of Morgan's gelatino-bromide paper, and, after an exposure of between six and seven seconds, the image was developed and fixed, these operations occupying about as many minutes as the exposure did seconds. An instantaneous shutter having been adjusted to the lantern lens, momentary pictures were flashed on the screen. Next came some examples of work done by the "new rapid process," the sixty-mile express train which seems for ever and ever to be on the point of coming out of the tunnel, being thoroughly appreciated by the audience; although that mischievous small boy who is said to save up his pennies in order to visit the Polytechnic, did enquire, in something like a stage whisper, how it was that the large and wool-like cloud of vapour managed to keep pace with the train and hang round about the funnel of the engine. Some London street views by Mr. York and others were next projected on the screen, and those who had seen the original negatives could thoroughly appreciate the surprising manner in which the lantern, when properly used, brings out unobserved details in small pictures Two views of London, taken from the top of St. Paul's by Mr. Hepworth, deserve special notice; and one of these rendered in a very perfect manner the peculiar effects of haze and smoke waves in a large city. When art is more understood in connection with photography, haze and vapour will not be so universally abhorred by the landscapist as they appear to be at present. These are good servants in composing a picture, although when too universal the result may approximate to the exceeding vagueness of the celebrated picture of Strasbourg at night.

To Correspondents.

Errata.—On page 206, instead of "Ag Br with alkaline pyrogallic, ferrous sulphate, and silver nitrate 5-7," read "Ag Br with *acid* pyrogallic, ferrous sulphate" &c. On page 181, "grammes" should be substituted for "grains."

*** A cheque for two guineas will be given for the best practical essay, "How I Retouch and Varnish My Gelatine Negatives." Contributions must be sent in not later than 1st July. For rules, see previous Nos. of the News.

Dry Plate Operator.—It results from the use of an over-soft gelatine in the preparation of the emulsion, from the very prolonged action of heat, or from other decomposing influences. In an exaggerated case such as you describe, the most effectual proceeding would probably be to immerse the exposed plates in a saturated solution of alum, rinse slightly, and allow them to dry. When dry they should be coated with plain (uniodised) collodion, and soaked in water till all greasy lines disappear; after which development may be proceeded with in the ordinary manner. It is scarcely necessary to remark that you are not likely to obtain quite such satisfactory results as would be the case with plates free from original fault.

W. Bradnee, Jun.—We would advise you to try the addition of one-third of its volume of plain collodion, and the use of a stronger bath. Perhaps, however, a simple plan would be to get the manufacturer to exchange the bulk for a more suitable preparation.

A Subscriber from the First.—Even if the article were not patented, it would not pay you to make one or two for your own use; and answers to all your enquires concerning it would certainly fill four or five pages of the News. Write to Messrs. Edmundson and Co., 19, Great George Street, Westminster.

A. M.—A knowledge of fine art will not be of much assistance to you in obtaining the degree of Master of Arts; classical and mathematical learning being the main points. You had better obtain the Cambridge University Calendar; and as regards becoming a member of the Society of Arts, write to the Secretary, H. T. Wood, Esq., House of the Society, John Street, Adelphi, London.

A. B. T.—1. About 14 seconds. 2. About 4 seconds. 3. You can occasionally select one by picking from a large batch; but it is not easy to get an opportunity of doing this. 4. We should generally prefer the 10 by 8.

T. L. B.—We do not understand what the stamps are for, and therefore have returned them. The principal fault in your group is the almost vertical lighting. Select a position where a more nearly horizontal light (not sunlight, of course) plays on the figures, and the lens is carefully protected against direct radiation from the sky. You cannot use a more suitable lens or better plates.

J. B. Holroyde.—A 4 per cent. solution is one which consists of 4 parts of the dissolved body and 96 parts of the solvent.

W. Gorden.—Messrs. Harvey Reynolds and Co., of 14, Commercial Street, Leeds.

Bala.—Perhaps you made your experiment at a very low temperature; the quantity referred to will readily dissolve between 50° and 60° Fah.

A Poor Photo.—You cannot do better than follow the directions given on these points in Captain Abney's "Emulsion Processes in Photography."

C. A. Owen.—You will find answers to all your questions on page 55 of our Year-Book for 1879.

P. B.—You should not only advertise but also look over our advertising columns. Your notion of offering a fee is of doubtful propriety.

Belmont.—The Act declares that the sole and exclusive right of copying, engraving, reproducing, and multiplying belongs to the author for the term of his natural life, and seven years after his death.

C. A. Johns.—There is no occasion to add alcohol under the circumstances.

Minnie.—The portrait is very good from a technical point of view, but it has not been retouched quite as much as is usual in the case of pictures from the fashionable studios.

M. H. T.—By a prolonged soaking in cold water.

Londoner.—The plates were supported, film downwards, over a piece of paper moistened with glacial acetic acid.

M. B. Loadman.—1. You are doubtless right as regards your view of the case, as there is a very essential difference between the processes named, especially with respect to the means adopted for producing the grain or stipple. 2 Not at present. 3. A considerable amount of time must be expended in order to bring the roller into a really good working condition. There is no necessity, however, to use ink, as ordinary middle varnish will serve the purpose equally well.

Fog.—It is probable that your bath is alkaline. Try the addition of one drop of nitric acid to each eight ounces. If a drop of the bath, placed on blue litmus paper, does not now slowly change the colour to a faint red, add an additional quantity of nitric acid—say, half as much as before—and test again.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1188.—*June* 10, 1881.

CONTENTS.

PAGE
Abnormal Results in Development 265
Hot Weather and the Bath 266
Photography In and Out of the Studio 266
Lens or no Lens? By Captain W. de W. Abney, R.E., F.R.S. 267
By-the-Bye—Work and Wages 268
Account of an Excursion of the Cheltenham Amateur Photographic Society. By One of the Party 269
A New Mercury Intensifier. By Cosmo I. Burton, and Arthur P. Laurie 269
Notes 270

PAGE
Topics of the Day—On the Washing of Gelatine Emulsion, and On an Effective Method of Controlling the Same. By J. M. Eder 271
French Correspondence. By Leon Vidal 272
Hot Weather Emulsion and the Development of Gelatine Plates. By Archer Clarke 272
Correspondence 273
Proceedings of Societies 274
Talk in the Studio 275
To Correspondents 276

ABNORMAL RESULTS IN DEVELOPMENT.

A great deal can generally be seen of the quality of a negative by carefully watching its behaviour during development of the image. For example, it is well known to the merest tyro in photography that, generally speaking, the rapidity with which the image appears is directly proportional to the length of exposure, and few would hesitate to assert that an image which only appears after a somewhat long period and after a considerable amount of coaxing has been insufficiently exposed. But in all cases it is of the utmost necessity that, before any conclusions are drawn, it is certain that the developer used is in an exactly normal condition. Necessary as this undoubtedly was in the days of the wet process, it is still more so now, in the days of gelatino-bromide, not so much because the development of these plates is a process of very much greater delicacy than before, nor because the usual formulæ for development present any remarkable degree of complexity or liability to error; but probably the greatest danger lies in the extreme simplicity of the whole process. The capabilities of gelatine are so great, the latitude of manipulation which it admits of is so wide, that mistaken conclusions and inferior results too often ensue from the very simplicity of the details which require to be attended to.

Those, for instance, who are in the habit of using the alkaline pyrogallic developer are very frequently extremely careless in their measurements of the quantities of ammonia or soluble bromide to be employed in the developer, although, perhaps, there is no more important condition of success than careful judgment in this particular. But perhaps even still greater laxity prevails in the estimation of the amount of pyrogallol to be used for a given quantity of developer. Few take the trouble to weigh out the pyrogallol exactly according to the formula. Such a process would scarcely be necessary after a short experience; but, nevertheless, the development of a gelatine plate is much more dependent upon the amount of pyrogallol employed in the developer than is commonly supposed. If, for instance, a gelatino-bromide dry plate be exposed and cut up into several pieces, on the development of each piece with a successively increasing proportion of pyrogallol it will be found that the development proceeds each time more slowly, until at last, when the proportion reaches far above the normal amount, the effect is apparently the same as if the plate were much under-exposed. We have found that four developing solutions in which the proportions of pyrogallol were successively 1, 2, 4, 8, behaved as follows: the times taken by the first three to develop the images fully were in the same proportion as the above numbers; but the last developer, containing eight times as much pyrogallol as the first, refused to develop any image at all until so much ammonia had been added as to spoil the negative entirely. If, on the other hand, too little pyrogallol be taken, the power of the developer is lost before sufficient density has been attained, or even perhaps before the details are fully brought out. From this it appears that, when used in too large a proportion, pyrogallol acts as a restrainer, until at last development is completely checked when a large excess is employed; and that the resulting negative may give the impression of over- or under-exposure when, in fact, the real fault lies in the development. As careful attention should, therefore, be given to the amount of pyrogallol used as to the quantities of the other substances employed in the developer.

Another unlooked-for result in the development of gelatino-bromide dry plates may arise from the influence of alum. Alum is now used so largely, and is so indispensable to successful manipulation, that it is probable that in many cases the developer may be contaminated with it, either on account of the previous employment of the developing dish for holding the alum bath, or intentionally on account of the tendency of some plates to frill even during development. Now it has been remarked that if an exposed plate be treated with alum it will refuse to develop, and if a plate similarly treated be exposed to light, it appears to be no longer sensitive. This would seem to point to the conclusion that alum has the power of destroying the action of light upon bromide of silver; in other words, of re-converting the sub-bromide into the state of bromide. That some kinds of alum have an oxidising action seems unable to be denied, for many samples of common potash alum have been found capable of converting appreciable quantities of ferrous sulphate into the ferric salt. Nevertheless, that this oxidising action is not exerted to any very great extent, tends to show that the difficulty of developing an exposed gelatine plate previously treated with alum, and washed, is not due to this cause so much as to the action of the alum upon the developer. However long a plate may be immersed in alum, it still shows the same tendency to darken in strong sun-light; and a plate subjected to the action of alum may still be developed after the addition of a large excess of ammonia.

Alum, therefore, does not destroy the sensitiveness of silver bromide, but has a considerable influence upon the action of the developer. The retarding action of alum may also be shown by adding to the ordinary pyrogallic developer a few drops of alum in the place of the soluble bromide; the effect being about the same as regards rapidity of development; but if much alum be added, the image refuses to develop with even a large excess of ammonia. This will explain why a gelatine plate, after treatment with alum, even if washed and dried, still shows a great indisposition to easy development; for, as is well known, alum has an important action upon gelatine, combining with it to some extent, and remaining in the film even after copious washing. But it remains yet to be seen whether the restraining action of alum is owing to its action upon the gelatine film, hardening it and making the silver bromide less easily soluble in the developer, or whether it is due to the reaction between ammonia and all salts of aluminium leading to the production of a salt of ammonium and a hydrate of alumina thus—

$$2AlNH_4(SO_4)_2 + 6NH_4 \cdot HO = Al_2(HO)_6 + 4(NH_4)_2SO_4.$$

In the former case, it is evident that alum would play the part of a true restrainer by diminishing the solubility of the silver salt; but in the latter case, its influence might be counteracted by the use in the developer of a sufficient excess of ammonia.

The intentional addition of alum, therefore, to the pyrogallic developer, or its accidental contamination with it, will lead to abnormal results; and any attempt to harden the film in the alum bath before or during development will be attended with most undesirable consequences

To those, again, who are in the habit of using both the ferrous oxalate and pyrogallic developers, and whose number of dishes is limited, it not unfrequently happens that the same dish is used for the pyrogallol shortly after being employed for the ferrous oxalate solution. It is not an easy matter, by ordinary rinsing with cold water, to clean the dish thoroughly from all traces of iron, and frequently sufficient of the iron salt remains to cause immediate discolouration of the pyrogallol, leading to a weakening of its reducing action, and to a consequent want of density in the resulting negative.

These instances will be enough to show how easily abnormal results may occur in development, unless care is taken to maintain a certain amount of uniformity in the conditions which are shown by experience to produce the best results.

HOT WEATHER AND THE BATH.

During the cold season of winter, and mild spring weather, slight faults in the constitution of the nitrate bath do not exercise their full measure of mischief; but when the full power of the sun's rays renders the studio almost like an oven, and converts the dark room into something recalling the black hole of Calcutta, every impurity which may exist in the silver solution, or may accidentally reach the surface of the sensitive plate, is all-powerful for evil; blotches, marking, and stains innumerable being the outcome, more especially when circumstances necessitate an unusually prolonged exposure.

The vital importance of making use of pure nitrate of silver has been repeatedly pointed out in our columns; and also the necessity of employing the purest water which can be obtained. Even when all reasonable precautions are observed, it is occasionally advisable to render the solution alkaline by the addition of a trace of sodium carbonate and to expose it to light for some days before using it; this precaution being often of considerable importance, when the weather is hot and sultry, or if long exposures are necessary; this latter condition often arising when one has to copy an old and dim oil painting, or to make a negative of a badly-lighted interior.

It is just during the bright and hot weather that the photographer is most liable to over-work his bath, or to saturate it with alcohol and ether. and the accumulation of these bodies is a source of more trouble than is generally believed. In the first place, the solvent power of the water is so far diminished that abundant crops of those peculiar crystals which give rise to pin-holes is the frequent result; while the general tendency of these organic fluids to break up the cohesion of the aqueous layer covering the collodion film often localizes any inclination towards oyster-shell or other markings, and leads to the destruction of a negative which might otherwise have been good. In addition to the above, it must be remembered that a plate must remain longer in a bath which is saturated with alcohol and ether, than in one which is free from these bodies. Now, this delay not only involves a loss of time—and this in the season when the photographer's time is especially valuable—but it also affords increased facilities for any organic poison which may exist in the bath to become absorbed by the film, and so largely increases the probability of markings and defects.

A most satisfactory proceeding, as regards the elimination of alcohol and ether, is to slightly boil down the bath each evening after the day's work is done; and, as a rule, it is unnecessary to evaporate to the extent of more than one-fifth of the bulk of the solution. In the morning, before the commencement of work, the liquid should be tested with the hydrometer bath-tester, diluted if necessary, and filtered. As nitrates other than that of silver accumulate in an old bath, and then affect the indications of the bath-tester, it is advisable to make up to an apparent strength a little over the original; the allowance varying from one to eight grains per ounce, according to the amount of work which has been done with the bath in question.

As regards the mischief which frequently arises from prolonged exposures, or in consequence of keeping a wet plate for a long time before development, few thoroughly appreciate the extreme importance of supporting the sensitive plate in such a way as to thoroughly guard against the ascent of dust by capillarity. In the case of an ordinary dark slide, it is a most difficult task to thoroughly remove all traces of dust from the angles of the frame. A usual remedy is to line each corner with damp blotting-paper; but if this intervenes between the wires and the plate, the position of this latter is so far altered that, in the case of a very open-apertured portrait lens, the picture is put considerably out of focus.

When a well-prepared collodion plate is allowed to rest on perfectly clean supports, made of wood saturated with paraffin wax, it is generally possible to give an exposure of several hours without defects arising; but, in such a case, it is necessary to guard against the drying of the film, the best means being to saturate the surrounding air with moisture, this being effected by lining the camera with wet blotting-paper, or, when the work is being done in an enlarging-room, by keeping the floor well watered.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Royal Academy and Photography—A New Photo-Engraving Process—Instantaneous Photography: A Suggestion—The Actinic Balance.

The Royal Academy and Photography.—For the first time since its establishment, the Royal Academy contains this year an engraving on wood, which has been accepted for exhibition. Whether the fact that the engraving happens to have for its subject the President's picture, "The Music Lesson," has had any influence on the hanging committee, we cannot, of course, say. The innovation, however, is worth recording, since, if wood-engravings may be admitted, possibly at some future time photographs may receive a like honour. It is possible, when this happy hour arrives, that the artists may receive a rude shock. Already photography has convicted more than one eminent artist of gross errors in drawing, while the exhibition of the conventional photographic portrait, with its pillar, its chair, its curtain, and the inevitable book, would do much to convince some of our portraitists—if they are to be convinced—that they are open to the same charge of conventionality which has so often been brought against the photographer. It is by no means certain, though, whether photography would be advanced in public estimation by an exhibition at the Royal Academy. After wandering over masses of colour of every conceivable tint, the human eye could not endure monochrome, and photographs would, by contrast, inevitably look poor and feeble. On the whole, the photographer had best be contented to reign at Pall Mall, than serve at Burlington House.

A New Photo-Engraving Process.—Many valuable discoveries are the result of chance. This seems to have been the case with Fritz Luckhardt's new process of photo-engraving. Being requested at a few hours' notice to draw a portrait for a circle of friends, he intended to rely on the assistance of a negative. The printing of the latter, however, was delayed, and to save time it occurred to Herr Luckhardt to coat the negative with yellow varnish, and to etch the portrait with the needle on the ground. As a caricature was the main object, the salient characteristics only of the negative were retained, the transparent parts being etched out, and the clothing altered. An engraved plate which can be used as a negative is thus produced, the action of light upon the sensitive paper placed beneath the negative being effectually suspended by the yellow varnish, so that only the transparent lines are produced by the graven print. Herr Luckhardt says, when once the principal lines of the original picture have been faithfully laid down, even an untaught draughtsman may produce an engraving of the portrait that shall at least have some resemblance; while a draughtsman skilled in cross-hatching, or a xylographer, should furnish a work which, placed beside a good woodcut, should exhibit a superiority recognisable even by the unprofessional eye. Besides the rapidity with which the engraving can be made, the possibility of the utmost correctness is offered, since lines which have been too deeply graved, or wrong lines, may be filled up again with yellow varnish, and engraved anew, a printing-frame and silvered paper offering a convenient method of watching and controlling the progress of the work. Where broken lines are desired, a pencil may be passed over them, and then they may be pricked, and so on. By transfer paper an impression from an engraved, yellow-varnished negative plate may be transferred to zinc, and in this way a plate suitable for printing with the letterpress printing-press will be produced. The yellow varnish, it may be mentioned, consists of common negative varnish to which a suitable quantity of aniline yellow has been added until it has assumed a dark sherry colour.

Instantaneous Photographs—a Suggestion.—The rage for being photographed in a fancy costume might, by a little dexterous management, be turned into a new direction during the summer months. The instantaneous pictures of Messrs. Marsh, Mr. Brownrigg, Mr. Mayland, and others, have shown us what can be done in the way of rapidity. Why should not this possibility be further developed? The favourite game of lawn tennis develops many effective poses; why should not the players be photographed in the midst of a game? Cricket clubs, again. The usual photograph of a cricket club, with all the figures drawn up against a wall or a hedge, as if they were waiting to be shot, is simply hideous; but a game of cricket at the height of a contest, with a Grace making a "splendid drive for six," a Shaw delivering one of his marvellous "slows," or a Lyttelton executing a neat bit of wicket-keeping to the discomfiture of the batsman, would be a different thing altogether. Of course the negatives would be of a small size, but processes of enlargement are now tolerably perfect, and this presents no very great obstacle. If attention were paid to this kind of thing, we might expect at the next exhibition to have marvels of instantaneous photography far exceeding in interest any number of railway trains going at forty miles an hour, but which, so far as the effect conveyed is concerned, might as well be standing still and blowing off steam.

The Actinic Balance.—Mr. S. P. Langley, of Allegheny Observatory, has devised an instrument for measuring radiant energy of marvellous delicacy. This instrument, which is called "the actinic balance," is thus described:—Suppose two equal wires to pass from a battery to a differential galvanometer, conveying equal currents, one of which tends to move the needle to the right, the other to the left; the needle, thus solicited, remains at zero. If, now, a ray of some source of radiant energy of higher temperature than the wires falls on one of them, the wire becomes heated, and therefore a worse conductor than before; hence less current passes through that wire, and the needle is deflected. The actinic balance is said to be five to one hundred times as sensitive as the most sensitive thermopile. Mr. Langley has been engaged in measurements of nearly homogeneous rays of heat in the diffraction spectrum. His experiments thus far prove the absence of any maxima in the spectrum; also that the actual solar energy (as it reaches us) is nearly at its minimum precisely where the so-called "actinic curve" is at its maximum. Further, the maximum of heat is found to be not in the ultra-red, but in the orange, while the curve of heat approximately agrees with that of light.

LENS OR NO LENS?

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

I HAD no time last week to say a word or two on Mr. Spiller's communication with the above heading, but I cannot let it pass, as I should prefer to do, since it contains not only a hit at myself, which is naturally of no importance to anyone except myself, but it also contains statements which require confirmation. First of all, let me remind Mr. Spiller that I made no promise whatever, as he seems to imply in his sixth paragraph. I said, by the application of the very self-same law which he previously quoted and used in his fifth paragraph, that a landscape should be fully exposed in eight minutes with an aperture of $\frac{1}{50}$ of an inch. Mr. Spiller has apparently failed to obtain a view of a well-lighted house—the reason for which failure I care not to inquire about (except in one particular, to which I shall refer immediately); but to show how experiences differ, I have before me a view of the Brompton Road, taken with an aperture of about $\frac{1}{40}$ of an inch, and a distance of plate from the aperture of nine inches. The exposure was three minutes, and the whole view is very fully out, with a fair amount of density. The time of day at which this view was taken was 4.30 p.m., with a good light. A point is represented by a disc of about $\frac{1}{25}$ to $\frac{1}{30}$ of an inch, and of course minute detail, is ill-defined, somewhat like what is seen in a negative where the camera has shaken.

There is one point in Mr. Spiller's experiments which requires, however, a little attention from me. He says: "In order to get a circular field of five inches diameter on the focussing screen, it was necessary to work at nearly ten inches distance from the front aperture. This made the light very feeble; but when I contracted the bellows to five inches, the field of view was of course only half the former diameter, &c." With an aperture cut in a thin plate the field of view is theoretically unlimited, and not a circular disc at all, the illumination very gradually fading away to nothing when the plate is infinitely large. I am afraid the aperture he used was cut in a thick board, which at a very small angular distance from the centre of the plate would seriously obstruct the illumination. In fact, one might almost calculate the thickness from the dimensions given thus—

$$5 \text{ in.} : \cdot 055 \text{ in.} :: 10 : x$$
$$\text{or, } x = \cdot 11 \text{ inches;}$$

that is, the thickness of the wood used would be about $\frac{1}{10}$ of an inch. With unpainted pine, and such kinds of woods, there would be great danger of fogging the plate through the transmission of light through such a thickness. If the edges were bevelled the thickness of the wood could of course be greater, but the contracted field of view shows the bevelling to have been insufficient. I would recommend Mr. Spiller in future trials to use tin-foil, which will be much thinner, and very much more opaque. Tinfoil can easily be cemented into a stop, and a hole pierced in it by a fine needle.

Now about the spectacle lenses. I must here remark that Mr. Spiller's spectacle lenses must have an extraordinary power of adapting themselves to his view of thinking.

They cannot have recognized the fact that they were to be used with gelatine plates instead of with Spiller and Brooks's process. Those I employed were lately out of the optician's hands, and had no bygone reminiscences. But, seriously speaking, there is no theory in the statement I made; it is a fact that with a spectacle lens you can get as good definition on a certain size of plate (such as I indicated at the meeting where I read my paper) as you can with an achromatic lens. Mr. Spiller complains that the image was dull. I should be surprised if it were anything else. It is nevertheless a fact that you can get a picture (and a sharp picture too) with a spectacle lens, and if he will forward me his lenses I will undertake to do so for him, as he seems unable to do so himself.

Once more I have to find fault with Mr. Spiller. I am not aware that I ever recommended (as is implied by the concluding paragraph) anyone to use a pinhole instead of a lens, and, like him, his "gallant friend" recommends anyone who has left his lens behind, to go back and fetch it, or, better still, to borrow one if he can. What the "gallant friend" did recommend, and what he does still, is, that in case where a long focussed achromatic lens is not at hand, an uncorrected lens may be used by stopping it down as suggested. The use of the micrometric plate divided to ·005 of an inch, and the power of the Stanhope lens, would then be unnecessary, since the aperture would be easily measurable with an ordinary rule.

By-the-Bye.

WORK AND WAGES.

There is one very good reason why few assistants in photography receive a high salary. If they are successful in portraiture, it either pays them best to work for themselves, or, what is the same thing, it pays their employer to receive them into partnership, or at any rate give them an interest in the business. There are, no doubt, still instances of high rates of pay to assistants on record, but they are merely the exception that proves the rule. For instance, we know of one West End firm who has concluded a three-years' engagement with a gentleman at the rate of ten guineas a week, the engagement not even stipulating that he shall perform photographic manipulations at all; in fact, he is an art assistant who walks from one studio into the other to pose the sitter. Another chief assistant we wot of, receives seven guineas a week, and indeed it is not unusual at all for the principal of a first-class studio to pay a salary of five guineas, when the head of the firm does not occupy himself with posing.

When in Paris not long ago, we had a conversation with the chief of one of the leading houses upon the subject of assistants, and he informed us that artists *du premier rang* obtained 500 francs a month—as nearly as possible, therefore, the rate of pay in this country—but that occasionally a higher and exceptional sum was given. Thus a thousand francs a month (£40) was mentioned in one instance, but when a man finds he is worth this to his employer, he naturally argues that he can make much more by working for himself. And if he is steady, straightforward, and business-like (all artists are not), the chances are that he does both wisely and well.

Assistants, *du premier rang*, as our Paris friend styled them, are so few—for the reason that most of them take to business themselves—that those in the great European cities may, he told us, be counted upon one's fingers. London, Paris, Vienna, and Berlin number, perhaps, a score between them, and for this reason it is scarcely worth while to regard them as a class. If a photographer is a thorough artist, then like all other artists, whether they be painters, draughtsmen, poets, or actors, his income depends upon his individual exertions, and is not to be governed like that of army men, civil servants, and professional men who belong to a certain grade or class. In a word, chief assistants in photography are outside any rule or regulation, and these we shall leave out of the question, therefore, in discussing the work and wages of photographic *employés* generally.

We may divide the personnel of an establishment, whether it is of first or second rank, somewhat as follows:—

Chief Assistant or Operator
Retoucher
Printer
Dark Room or Assistant Operator
Mounter
Spotter
Keeper of Books and of Reception-room.

Naturally enough, two establishments are never conducted on like principles. There are some houses, where a vast amount of work is performed, in which the studies are subdivided to a much greater extent, and others—especially in these days of gelatine—where two or three assistants, male or female, amply suffice for the due performance of all work. Again, there are firms in which the principal is—as he should be—the chief worker and directing spirit of the establishment; and others again in which he is but the business manager, leaving both the artistic and technical duties in the hands of his employés. In the latter case the chief assistant or operator (as we suppose we must call him, much as we detest the word) must possess of necessity some degree of art culture, and should be thoroughly well paid; but if he is under the direction of the principal, then naturally enough he can expect but a moderate wage.

Two and three guineas a week now-a-days appear to be considered good pay for a competent operator, and if he works cleanly, and is thoroughly competent to manipulate wet and dry plates, it is certainly not a high sum. But thirty shillings to thirty-five is by no means unusual, we are sorry to say, if a well-educated and highly-trained operator is not sought for. Many principals demand merely that their assistants shall know no more than work a clean plate, and in that case, high wages are scarcely to be looked for.

A good retoucher should be able to claim not less than two guineas a week; in Paris we heard of an Italian (Italy seems as famous for its retouchers just now as Germany was five years ago) who drew a monthly salary of four hundred francs, or sixteen pounds. But many firms have lately made a practice of having their negatives retouched out-of-doors, excellent work being performed at the rate of sixpence for a carte negative, and ninepence or one shilling for a cabinet. All negatives are more or less retouched, as everybody knows, at the present moment, constituting an additional tax on the photographer's wares.

The term printer is a very vague one, and photographic printers receive all sorts of wages. Twelve years ago we knew a Cambridge firm which paid its printer three guineas a week, but we doubt whether in London or the provinces there are many such berths to be found now. Two guineas now-a-days is looked upon as unusually good wages for a printer who will go through with the toning, &c., and who is supposed to understand the most delicate vignette printing. Printing of plain pictures may well be undertaken by a youth or girl with wages of 15s. or 18s. a week, and a competent printer of experience is expected for thirty shillings, who must not produce too large a percentage of waste pictures, and understands something about combination printing.

The assistant operator in the dark room who cleans and coats plates (gelatine workers, we are told, are able to do without one) is supposed to be learning his duties and improving himself, and must therefore fain content himself with a wage of eighteen or twenty shillings a week, while girls who occupy themselves with spotting and mounting enter usually with eight or ten shillings a week, and when skilled at their work generally secure twice that amount. Rough spotting may be learned in a week or two, but in first-rate houses, where something more is required of the spotter—touching in the high lights, &c.—then not only is better pay given, but less work is got through. Six dozen pictures to spot and touch is considered a good day's work at some establishments, while in others not less than a gross is expected to pass through the spotter's hands.

To keep the books neatly and accurately, a duty which is not unfrequently coupled with that of attending the reception room, demands tact and an aptitude for business. If a lady happens to be a good saleswoman, she may well be the most valuable of all the staff of assistants, for upon her depends a very great deal indeed. A keen perception, ready wit, a manner not too obtrusive, and yet frank and pleasant withal, are qualities extremely rare, and deserve to be recognized when they are present. The lady entrusted with reception room duties has a most difficult task to perform, and if she performs it successfully deserves to be well recompensed.

The "At Home" next week will be "The Royal School of Gunnery at Shoeburyness;" the following "By-the-Bye" will be "Wanted, a Pupil."

ACCOUNT OF AN EXCURSION OF THE CHELTENHAM AMATEUR PHOTOGRAPHIC SOCIETY.

BY ONE OF THE PARTY.

On May 3rd, five amateurs, a small, but gallant band, in light marching order, met at 10·15, and booked for the small station of Lydbrook Junction, on the banks of the picturesque river Wye. Arrived here, a short walk along the line brought us to the river. On the river-bank, looking up the stream, with the sun dipping in and out of luminous clouds, we exposed our first batch of plates. Then we limbered up, wandered on to the centre of attraction, the picturesque little hamlet of Welsh Bicknor, consisting of a small Gothic church, with lych-gate to the secluded churchyard, a snug vicarage-house, backed by the richly wooded hill, and the river rapidly flowing by in front. These objects, together with an adjoining gabelled farm-house, with rustic surroundings, formed abundant food for the cameras.

Seeing that there was close by at the horse-ferry a passage to and fro of a wagon and horses with coal, it was suggested: "Now is the time for instantaneous plates," and, "Drop-shutters to the front." The boat having swung from our side, three cameras were placed in position to "take a shot" at the landing-place on its return. All being ready, and the boat still on the other side, it was thought that the interval, and also the inner vacuum, might be profitably filled up, at the same time, by luncheon. After a few tantalizing mouthfuls, the cry is, "They come!" A rush is made for the cameras, not omitting, however, to carefully secure the edibles from sundry prowling dogs which had bestowed their attentions, perhaps not altogether disinterestedly, upon us. The old boat is hauled up, the white horse in the shafts is steady, the old leader, who has been munching on the grass bank, nods drowsily in the sun, the men at a signal stand at ease, the trigger is touched, and the scene is "hit off" to the life. It may be of interest to note that the primitive boat, formed of wicker and hide, is still in constant use by the salmon-fly-fisher, as we had ocular evidence of the fact that day.

Having to take a train at the next station, there is not much time to be lost, but the view from here being even more charming than the other, "must be secured," so cameras are pitched again, and when begun, soon done, the exposure being only three seconds.

At Lower Lydbrook the rail spans by a handsome stone viaduct a side valley; this, in combination with some fine trees on one bank, forms a pictorial subject, reserved for a future occasion, as also was the upper bend of the river, which looked very inviting. This Severn and Wye Railway is principally a mineral line, and it may be due to that fact that, having by a hot and stiff ascent reached the station, we found the wooden box closed, and that we could not take tickets till we reached the next station. The train, however, took us, as we thought, upon trust, but in fact we were carried gratis to the next station, an unusual instance of liberality deserving of record. The line winds up and round the hills, sometimes shooting through the spar of a hill, or terraced along the sides through a country of much wild beauty, though here and there disfigured by the iron and coal works, with their black and bare heaps of débris. At a considerable elevation, we find ourselves passing through the very heart of the forest (of Dean) where the pure bracing air makes the sprits rise and the blood circulate more briskly. The woody glades, with here and there a sedgy pool in the neighbourhood of "The Speech House," made us long to linger, and plan to revisit this picturesque locality. We had, however, to meet a South Wales train, and so we retained our seats, and ran down the incline to Sydney Town with glimpses of picture subjects on either side of us nearly all the way. An hour at Sydney enabled us to stretch our legs with a short walk to the church, where one of the party had on a former occasion prospected a camera object, in the curious old Lychgate of the churchyard. On it the evening light was falling just as we desired, so a camera was set up, a selection from the school-children who had followed the march of the camera men, *alias* "likeness-takers," served for the life—in this case creditably still life—of the picture. The reward followed in the shape of a scramble for half-pence. The idea of such common coin being inexhaustible seemed to enter the juvenile minds, and served to attach them to us almost too pertinaciously all the way to the station, had we not turned their attention to account by getting them to carry our traps. In an hour and a-half we were at home again, all the better for a pleasant country ramble.

A NEW MERCURY INTENSIFIER.

BY COSMO I. BURTON, AND ARTHUR P. LAURIE.*

Before proceeding to give an account of the new mercury intensifier which we propose to describe, it will be well to give an explanation of the action of the ordinary intensifier, where the negative is first acted on with mercuric chloride, and then with ammonia. There has been some dispute about this action, but the following appears to be the true explanation of it. The negative may be considered as having metallic silver in the lights, and nothing at all in the shadows. Mercuric chloride is poured on the plate and is reduced by the metallic silver of the image to mercurous chloride, chloride of silver being formed. The action is explained in this equation:

$$HgCl_2 + A = HgCl + AgCl.$$

Mercurous chloride, and silver chloride being both white insoluble powders, this process has the effect of bleaching the image.

The negative is then washed, in order to remove excess of mercuric chloride, and treated with ammonia, which produces a black precipitate of basic salts of mercury and ammonia, and dissolves out the silver chloride, so that the effect of the whole process is, to substitute for the silver of the image, certain salts of mercury and ammonia.

The following experiments prove that the above is the true explanation. Metallic silver was deposited on the sides of a test-tube, which was then thoroughly cleaned. Mercuric chloride was then poured in and the silver disappeared, a slight white precipitate forming in its place. On adding ammonia there was a thick white precipitate with the mercuric chloride, and at the same time the bottom of the test-tube where the silver had been, was again blackened.

In the next experiment a gelatine negative was intensified in the usual way with mercuric chloride and ammonia, but the ammonia was poured off into a test-tube and acidified with nitric acid, when a white precipitate of chloride of silver was thrown down. If a negative is treated with ammonia without having been previously treated with mercuric chloride, and the ammonia poured off and acidified, no chloride of silver comes down.

Having satisfied ourselves that this was the true explanation of the ordinary process, we bleached a negative by mercuric chloride, and exposed it to sunshine for a long time, supposing that the silver chloride would blacken, and that the negative would be rendered much denser than by the ordinary method, especially as the process could be repeated any number of times; but for some unknown reason the silver chloride in the film does not change on exposure to light.

In order to get a sensitive salt in the film after bleaching, we substituted mercuric bromide for mercuric chloride, and with complete success. The process, described from the beginning, is as follows:—Make a saturated solution of mercuric bromide (solubility 1 in 250). Employ this solution to bleach the negative which requires to be intensified, in the same way as when

---

[*] Read before the Edinburgh Photographic Society.

mercuric chloride is used. When the negative is thoroughly bleached (the bleaching takes rather longer than with the chloride), wash it and expose it to light; a minute or so in sunlight is enough, but the longer the better. Then apply a developer exactly as if developing a negative, and in a short time the image will blacken and be considerably denser than before the action of the developer.

In this case the explanation is, that the developer reduces the silver bromide to metallic silver, and the mercurous bromide to metallic mercury, which amalgamates with the silver, and therefore does not evaporate.

This negative was intensified several months ago, and has been kept before the fire for a long time without its density being at all diminished.

If performing this process once does not sufficiently increase the density of the negative, it may be repeated apparently an unlimited number of times.

The negative which you have in your hands was intensified in the following manner:—First, a small part of one end was varnished and the unvarnished part intensified, then a little more was varnished, and the rest again intensified, and so on, three times.

In this process either ferrous oxalate or pyrogallic acid will do for the developer; but ferrous oxalate is decidedly preferable, because the negative needs to remain a considerable time in the developer in order to reduce the silver and mercury bromides. and pyrogallic acid stains the film and renders it dense all over. Besides which, by the action of pyrogallic developer on mercuric bromide, metallic mercury is not produced, but, probably, basic salts of mercury and ammonia, which gives the negative a dark yellow-brown colour.

The chief advantages which may be claimed for this process are—that by means of it a negative may be intensified to any extent when ferrous oxalate is used as the developer, and the colour is better than with the ordinary mercury intensifier, and the shadows remain perfectly clear.

Notes.

Our next series of "At Homes" will deal with studios north of the Tweed. A visit to the well-known establishment of Mr. John Fergus, at Largs, will commence the series.

The *Monatsblätter* claims for Herr Gerothwohld (who founded a photographic business in Frankfort in conjunction with Mr. Tanner, of London, in 1843) the honour of having been the first to establish a studio in Europe. But that the photographic studio was well known in London in that year is evident from the picture of George Cruikshank, which we reproduced in these columns in April last. Cruikshank's engraving appeared early in 1843.

The Stereoscopic Company and Messrs. W. and D. Downey have joined hands with a view to stemming the tide of photographic reproductions which is setting in from abroad. Photographs of Lord Beaconsfield, reproduced from pictures taken in this country, were selling a penny a-piece upon barrows in the streets, not long ago; and now it seems Messrs. Downey and the Stereoscopic Company complain that photographs taken by them of the Queen and the Royal Family have also been copied in large numbers, and imported into this country. A summary of the trial appears in another column, the defendant undertaking to keep an account of his sales until the matter is decided.

A clever group of three hundred bicycle riders, "standing by," has been secured by Mr. Marshall Wane upon a 24 by 20 collodion plate; the exposure was ten seconds, with a Dallmeyer 8D well stopped down.

Truth says:—"I wonder that Mr. Gladstone has not seen his way to impose a small tax on cartes-de-visite. Revenue is already obtained from playing-cards, and by imposing a duty on 'counterfeit presentments' we might add to the Exchequer, while at the same time a penalty would be placed on pride." A nice idea, certainly, but we know a nicer: tax *Truth* and the Society Journals.

Sir George Airy resigns the appointment of Astronomer-Royal in August next. As many of our readers are aware, Mr. James Glaisher, F.R.S., the President of the Photographic Society, served as Sir George's lieutenant at Greenwich for many years, and would now doubtless have succeeded his chief but for the fact that the worthy President some time ago retired from active service at the Royal Observatory.

The town of Ghent thinks it should be better photographed than it is, and to bring about this end a photographic exhibition of pictures of the city it to be inaugurated in August. The promoters of the exhibition, moreover, give their views as to what special buildings and monuments in the town it is desirable to have depicted, and any of our readers may receive this and other information if they apply to the Secretary of the *Chambre Syndicale* at Ghent.

Meanwhile we may mention that not less than a dozen views should be submitted, printed either in carbon, Woodburytype, or fatty ink, and measuring 24 by 18 centimetres —rather large for Woodburytypes and Collotypes from nature. The prizes are: 1. A silver-gilt medal, 1200 fcs. in money, and a diploma; 2. A silver medal, 600 fcs. in money, and a diploma; 3. A bronze medal and a diploma.

Christmas cards are becoming an institution indeed. Messrs. S. Hildesheimer and Company advertise that they will give the sum of two thousand pounds in prizes for designs painted in oil or water colour to be submitted to them by the 1st July next. There is to be one prize of £150, two of £100, and nearly a hundred other prizes of not less than £20. The judges are George Leslie, R.A., Briton Riviere, R.A., and W. Hagelberg.

Stannotype is the name given by Mr. Woodbury to his simplified Woodbury process, in which the hydraulic press is dispensed with; we are glad to hear that it has already established a firm footing, not only in this country, but on the Continent.

A simple method of testing emulsion for any injurious excess of soluble bromide is described in Dr. Eder's "Topic" this week. One addition only of standard silver solution is made, the dose of this being gauged to the minimum quantity of soluble bromide previously determined upon.

"I am just off to photograph a house and grounds," said a photographer to us the other day. "The place is for sale, and is worth £10,000, but with a nice set of pictures the owner hopes to get a higher bid for it."

Blue rays travel more than one per cent. faster than red rays, is one important conclusion arrived at by Dr. J. Young and Professor Forbes, in their recent investigation into the velocity of white and coloured light. As to the rapidity with which light itself travels, this depends upon its nature; the more refrangible is the source of light, the greater is the velocity. An electric light *in vacuo* is estimated to travel at the rate of 187,273 miles per second.

A trial has just taken place at Liverpool with the object of determining whether a photo-engraving is an engraving in the ordinary sense of the word. As the matter is of interest to all photographers, we publish an account of the action in another column.

◆

Topics of the Day.

ON THE WASHING OF GELATINE EMULSION, AND ON AN EFFECTIVE METHOD OF CONTROLLING THE SAME.

BY DR. J. M. EDER.

1. The question whether the time necessary for washing an emulsion of gelatine could not be shortened has often been raised, and while some experimenters maintain that a half-an-hour's washing is quite sufficient, there are others who prescribe one of at least twenty-four hours. In order to obtain an exact solution of this problem, I undertook a series of experiments to ascertain the nature of the washing process, in the course of which I arrived at several highly interesting results.

I took a gelatine emulsion containing 5 per cent. of gelatine and 2 per cent. of excess of soluble bromide, and squeezed it through coarsely-woven canvas; in one set of experiments, the netlike canvas employed had meshes of 4 m.m. in diameter, in another it was more closely woven, and the meshes were of from 1 to 1½ m.m. in diameter. Separate portions of this emulsion, each weighing 25 grams, were then washed, some by being laid in running water, others by suspension (enclosed in a small bag of fine stuff) on the upper surface of a large vessel full of water. The amount of soluble bromide still remaining in the emulsion was now quantitatively determined at occasional intervals, and the following results, which I have collected in the form of a table, were obtained:—

A.—*Gelatine in Cylinders of* 4 *m.m. Thickness.*

	Percentage of Soluble Bromide Remaining in the Emulsion.	
	Pot. Brom.	Am. Brom.
Original emulsion	2·00	1·65
After 35 minutes in standing water	0·42	0·32
Do. do. running do.	0·20	0·18
After 1¼ hours in standing do.	0·08	0·07
Do. do. running do.	0·04	0·04
After 12 do. standing do.	0·04	0·03
Do. do. running do.	0.02	0·01

B.—*Gelatine in Cylinders of* 1 *to* 1½ *Thickness.*

	Pot. Brom.	Am. Brom.
Original emulsion	2·00	1·65
After 35 minutes in standing water	0·05	0·05
Do. do. running do.	0·03	0·04
After 1½ hours in standing do.	0·02	—

It follows from this that 35 minutes' washing, either in standing or running water, is not sufficient for an emulsion in the form of thicker cylinders, since the amount of soluble bromide still remaining, which is as much as from 0·2 to 0·4 per cent., has a perceptibly injurious effect on its sensitiveness. The thinner cylinders were sufficiently washed in running water at the end of 35 minutes, and not quite so effectively in standing water; 1¼ hour's washing in running water was also sufficient for the thicker cylinders; the same time in standing water gave tolerably good, though not quite so satisfactory, results. The same percentage of bromide is washed out after 1¼ hours in running water, as after a much longer time in standing water. It is worthy of note that potassium bromide and ammonium bromide are got rid of with about equal rapidity.

Photographers may thus convince themselves that when the emulsion is finely subdivided (that is, squeezed through canvas with a 1 to 1¼ m.m. mesh), a washing of from a half to three-quarters of an hour in running water, or even the same time in standing water, provided it is frequently changed), will suffice; further, that when more coarsely-shredded (passed through a network of 4 m.m. mesh), from one and a half to two hours' washing in running water is required in order to get rid of all injurious bromide, and that in standing water (which is often changed) a longer time—three hours and more—is necessary. Speaking generally, however, I consider that squeezing through a more loosely-woven stuff is to be recommended, in spite of the longer time required for washing, because afterwards, when drained, less water adheres mechanically. It should also be observed that the length of time required for washing is affected by various secondary considerations—for instance, by the temperature of the water, by the hardness and toughness of the gelatine, &c., &c.

2. Testing the emulsion for any remaining soluble bromide can, according to my own observations, be readily effected; 25 grams of the emulsion are weighed out and dissolved in an excess of hot water; this solution is then allowed to grow quite cold, a little neutral potassium bichromate is added, and then a sufficient quantity of a solution of silver nitrate of known strength is mixed with it, to turn the light yellow colour into red.

The above is the established method of testing; but I can recommend, in preference, the following convenient and simple means of ascertaining the amount of soluble bromide remaining in the emulsion. A solution is prepared containing accurately 4 grams of silver nitrate in a litre of water. Of the emulsion to be tested, 25 grams are weighed out in a fluid state, diluted with from four to five times its volume of water, then cooled, and mixed with neutral potassium chromate until the solution assumes a manifest yellow tint. Into this solution are stirred in 10 cub. cents. of the above-named silver solution, producing—when the emulsion has been properly washed to answer ordinary purposes—a reddish yellow to deep red colour. Insufficiently-washed emulsion shows no change of tint. This reaction will show a trace of soluble bromide as little as 0·1 per cent.

Emulsions that have been thoroughly washed show a change of colour with even 5 cub. cents. of the silver solution, and in that case they contain less than ·05 or ·06 per cent. of soluble bromide. Should the addition of even 20 cub. cents. of the silver solution not redden the mixture, the emulsion must have been very inefficiently washed. The test succeeds only in neutral aqueous solutions of gelatine; those which contain acetic acid should have the acid neutralized before being submitted to the test. The whole analysis should be carried out in daylight; ordinary candle light or gas light will, however, also serve the purpose, as the change of colour is readily discernible by artificial light.

The "Topic" next week will be "Landscape Studies," by H. P. Robinson.

FRENCH CORRESPONDENCE.

Process of M. Christian—Gum and Iron Process

Process of M. Christian.—In the number of the Photographic News for the 27th of May, mention is made of the analysis to which Dr. Eder has submitted the process of M. Christian. With regard to that subject it may perhaps be of interest to give a short abstract of the patent which M. Christian took out on the 9th of November 1880. "The following," he says, "is my method of operating:—1. A mixture of some binary or tertiary compound of silver insoluble in water is added in a very small quantity to the pulp of paper by mechanical or chemical means. 2. This compound may also be attached to the surface of the paper, but incorporated in some medium such as fermentable, starchy and nitrogenized substances, containing sulphur in a latent state, and also solid hydro-carbons or their derivatives, as well as fatty matters combined with one or more metallic oxides. The mixture thus obtained may be applied in any way, either by immersion, or by superposition with a brush, or by means of the roller employed in mechanical printing. In all these methods of producing the sensitive film, the means of developing the image is the same. It is effected by placing on the film the negative with the glazed side downwards; when the whole is exposed to even the faintest light, the image is produced with greater or less rapidity, according to the extent to which the fermentation of the mass has been allowed to proceed. In certain cases the mere addition of ammonia will produce the image; but in the greater number of cases it is better to employ reducing agents which develop the image slowly, thus permitting the development to be stopped at any point which may be desired. To obtain the ordinary photographic tint, the print must be washed, and then passed through a bath composed of sulphuric acid, sulphocyanide of potassium. proto-chloride of tin, and fermented albumen. For the proto-chloride of tin may be substituted a number of metallic salts, which either alone or combined in the compound above described, produce the same result. After taking the print out of this bath it is washed and passed through a second bath, consisting of some base which gives, according to its character, the wished-for colour warm, black, reddish-brown, green, blue, white, yellow, &c., the process is completed by again washing. I thus produce chemically and metallic oxide, which remains unchanged by exposure to the atmosphere." M. Christian's specification contains other details relating to modifications of the same process, but it is unnecessary to give them at length. I confess that I do not quite understand all that he describes, and I hesitate to adopt the theory—although I believe that it is advanced in perfect good faith—that these prints possess the stability which has been attributed to them. If they are really permanent, I do not see how to explain that one of them, which was lying on the chimney piece of my workroom among a number of other prints taken by the ordinary process of albumenized silver, suffered so great a change as to become absolutely spoiled. The questions which present themselves are: Is there some fault in this process? Or does it contain something which is really of value? These are points to which the inventor will do well to give close attention; however fine may be the theory, nothing can be maintained which is not approved in practice.

Gum and Iron Process.—The following is an extract from a patent specification, which was taken out by M. Joltrain, on the 24th of March last, "for a photographic process for reproducing drawings, maps, and designs for lace, in black line on white ground:" this process is called by the inventor, gommo-ferrique. M. Joltrain's sensitive liquid gives a rapidity requiring only a few seconds of exposure in the sun, and a few minutes in the shade or even in an intense fog. The photographic paper prepared with this liquid gives results which allow of the reproduction of drawings made only with an ordinary pencil. The reaction in the developing bath takes place instantaneously. The following is the composition of the liquid:—

Gum	25 grams
Sodium chloride	3 ,,
Ferric chloride at 45° Beaumé ...	10 c.c.
Ferric sulphate	5 grains
Tartaric acid	4 ,,
Water to make up to	100 c.c.

The developing bath may be a more or less concentrated solution of red or yellow prussiate of potash; it may be either neutral, acid, or alkaline. After exposure, the print is plunged into the developer, and the parts which have been preserved from the action of light by the lines, turn a deep green colour, while the rest of the sheet undergoes no change. It is washed in water to remove the prussiate and to stop the reaction, and it is then placed for some minutes in a bath acidulated with either acetic, hydrochloric, or sulphuric acid, where all the substances which may affect its whiteness are removed, and the lines assume a black colour, with an indigo reflection. It is once more washed in pure water, and then dried. **Leon Vidal.**

HOT WEATHER EMULSION AND THE DEVELOPMENT OF GELATINE PLATES.

BY ARCHER CLARKE.[*]

I think it most desirable that every operator should know how to make or manufacture the chief articles with which he works—not that he can produce them as a rule either so cheaply or as good as he can buy, but there is a certain amount of innate consciousness and pardonable pride in being able so to do. In days long since I made my own gun-cotton, collodion, salted and albumenised my paper, and made nitrate of silver and chloride of gold. The knowledge gained in making the latter was invaluable, and for years a pocket-saver, the other four things being simply interesting.

To return to gelatine. I am not here to-night to bring any startling novelty before you, but to take my stand on the solid and well-known formula first published in *The British Journal*, and written, I believe, by Mr. W. B. Bolton. This article was the turning point in the making of gelatine emulsion, for up to the time the plan of Mr. C. Bennett had been followed—long emulsification, five to seven days at a temperature about 100° F., and with the full quantity of gelatine. Now, this introduced a new departure. First, the emulsification took but half-an-hour; but instead of not exceeding 100° F., we boldly ascended the thermometer till we reached 212° F., the boiling point of water, and instead of cooking all our gelatine, the very minute portion of one grain of gelatine was used to each ounce of emulsion required. Although the formula was made known now nearly two years ago—and two years in science now-a-days does, indeed, mean a lifetime—aye, and even more than a lifetime, to what it did within the recollection of some—the only alteration that formula needed was, as the temperature increased, to add half-a-grain more gelatine to the ounce, until the limit of three grains of gelatine for each ounce of emulsion is arrived at. This helps to prevent granularity in hot weather. This formula may be called the "acid process," in contradiction to emulsion as made after the methods of Drs. Monchoven and Eder, &c., in which liquor ammonia is used instead of so great heat. This is the "alkaline process," as those of you who witnessed the demonstration at Ashley's Hotel well know. Strict neutrality does not do. Use either end of the stick, but not the middle.

I may say that after that meeting, although nearly one of the last to leave Ashley's, I made ten ounces of emulsion that night according to the formula given, and succeeded in making thoroughly satisfactory emulsion, and which, when coated, exposed, and developed side by side with another plate, gave more density but was considerably slower. Mr. Henderson subsequently informed me that it required a considerable amount of washing, and that he gave from four to twenty-four hours.

Those who have made emulsion will bear me out in the following advice—which is to use a similar-shaped and sized vessel, and have as nearly as possible the same quantity of water for cooking each batch. In washing the set emulsion, have the water as cold as possible, especially for the first washing.

---

[*] Abstract of a communication to the South London Photographic Society

We most of us remember the story told—I think by Professor Stebbing—of how Photographer No. 2 could never wash his emulsion when the amiable wife of Photographer No. 1 indulged her husband in home-made bread, and she baked twice a week. The reason was the water supply pipe ran through the house of No. 1 to get to No. 2. There has been more emulsion spoilt through trying to wash in water not cold than many are aware of. I have had failure through my supply pipe being conveyed over the ceiling of the washing room, and the heat of gas made the first washing water warm. I have also had failure from impure methylated spirit and distilled water, and once through the nitrate of silver containing some impurity or from being adulterated. It required more than double the usual amount before there was a trace of free silver. I have never had a bad sample of bromide, iodide, or chloride, either of ammonia or potassium.

Respecting formula: take one in which the particulars are fully described, and work at first strictly according to the directions there given. When thoroughly familiar with the process then make any alterations your own practice or ideas may suggest; but I strongly impress upon anyone trying a formula for the first time to work exactly as directed.

Mr. Beebe says:—"I have made about sixteen batches of emulsion and thrown them all down the sink. I find the hardest thing I ever attempted in my life was emulsion-making." Doubtless many can say the same thing. I know I could say so once, and perhaps may have to say so again. It is not difficult to make or to mix an emulsion, but it is difficult to make one week after week that will work up to the standard of our best makers.

Dr. Eder's process, which is a sample of the alkaline method, you will find at page 142 in the Year-Book of Photography for 1881 described in full. The formulæ in English weights and measures are as under:—

No. 1.

Bromide of potassium	62 grains
Gelatine	108 to 124 ,,
Water	$1\frac{3}{4}$ ounce
Nitrate of silver	77 grains
Water	$1\frac{3}{4}$ ounces

Liquid ammonia is added to the nitrate of silver till the brown oxide of silver is redissolved. The other formula mentioned there is of the same proportions; but the liquid ammonia is not added till after the emulsion has been boiled twenty-five to thirty minutes, and cooled down to 93° F.

The formula which I am about to demonstrate, and which is called "hot-weather gelatine process," is as under:—

Gelatine	5 to 15 grains (according to the temperature)
Water	2 ounces
Bromide of ammonium	60 grains
Hydrobromic acid	2 drops
Nitrate of silver	100 grains
Water	2 ounces
Gelatine	100 grains

Mix at a low temperature—say 90° or 95° F. Add the silver in as fine a stream or spray as possible to the bromide gelatine solution, and stir well, boil for half-an-hour, cool rapidly, and add the 100 grains more gelatine. Pour out to set, and, when set, break up the emulsion by any of the well-known means. Cut it up small with a piece of glass, or squeeze it through coarse canvas into iced water. Wash, drain well, add half-an-ounce of methylated spirit, and make up to five ounces if needed; but it is most probable the gelatine has taken up the other half-ounce of water in the washing.

I have here fifteen grains of gelatine, sixty grains of bromide of ammonium, and water two ounces; these I now mix in this bottle, and stand in warm water to dissolve. In this bottle I place 100 grains of nitrate of silver and one and a-half ounce of water. Now that both are dissolved the silver is sent in to the bromised gelatine in the form of a fine spray, well stirred all the time. I now add the other half-ounce of water to rinse out the silver bottle. In practice I use this stone jar, to which I shall now transfer the argentic bromide; it is then placed in a saucepan, with water about half-way up, and some means must be adopted to keep the jar off the bottom of the saucepan. I use a circular piece of wood. We will now suppose the emulsion to be cooked and cooled down to 95° Fahr., the other 100 grains of gelatine are added, poured out in a flat dish, and set firmly. To save time I have here some old emulsion already set. A little cold water is poured on; it then readily leaves the dish. Now transfer it to the "brawn presser," the bottom of which is covered with fine copper gauze; you see it comes through in a fine state of subdivision. We will now wash under the tap from five to seven minutes, drain well, re-melt, add the half-ounce of alcohol, filter, and coat a few plates. I need hardly say every operation—beginning at the mixing of the bromised gelatine with the nitrate of silver—must be done in a very subdued ruby-orange light. I am induced to make this observation for this reason:—A gentleman who had witnessed a similar demonstration went home and did likewise—that is, made it in the full glare of the gas—and wrote to the demonstrator stating he had fully followed his instructions, and got nothing but fog. The wonder would have been if he had obtained anything else.

I will mention the formula I find most useful, and state an interesting fact on over-exposure. The formula that works best in my hands for plates, the exposure of which is known to be about correct, is the following:—

Water	100 ounces
Citric acid	1 drachm

In a Winchester or large bottle place—

Pyrogallic	1 ounce
Citric acid water from above	9 ounces

Filter the pyrogallic and acid water into the 100 ounces.

Liquor ammonia	8 ounces
Bromide of ammonium	1 ounce

If 100 ounces of water are added to the ammonia, then use equal quantities of each; but I prefer to keep the ammonia without water and add from five to eight drops, according to the exposure. It is advisable to have also ready mixed separate solutions of the above, viz., liquor ammonia and bromide of ammonium, in case of over-exposure. I exposed two plates the other day, and gave each twelve seconds when four or five would have been sufficient. The first was developed with Swan's formula, viz:—

Liquor ammonia	1 ounce
Bromide	$\frac{3}{4}$,,

I chose this because, so far as I am aware, this is the largest proportion of bromide any maker recommends. The picture was some time—say nearly a minute or so—before any trace appeared, but the image was a mere ghost with plenty of detail. The next plate I started with double the quantity of pyrogallic and fifty drops of bromide of ammonium added—strength one ounce to eight ounces of water, and these two allowed to stand on the plate at least one minute. Then I added ten drops of pure liquor ammonia, two drops at the time, and in ten or twelve minutes got a really decent negative—slightly veiled in the shadows, it is true, but a good printer.

In conclusion; let me tell how "G. W. F." found his plates develop. He says:—"When I came to develop them they balked and wrinkled, and behaved shameful, and knowing I was a green hand, they actually split their sides (with laughter I suppose). They slid off down the sink, and one of them had more wrinkles than any monkey's face you ever saw."

Correspondence.

INDEPENDENT SIMILARITY OF IDEAS.

Dear Sir,—It is not a new thing for two persons to be found working independently at the same idea, and the present instance is only a further illustration. Rather more than three years ago I designed a repeating camera on the same principle, and, with the exception of some details, almost exactly like, the one designed by Mr. Pumphrey, and illustrated in your last issue. Curiously enough, I had only a short time ago commenced to make drawings of the same to illustrate an article or topic on the subject, but more important matters had caused me to put it aside, or it would already have been described in your journal. I described the camera and showed the drawings as long as three years ago to several gentlemen well-known in the photographic world; among others, to Mr. J. Thompson, F.G.S., and M Rommelaire, then Editor of the *Bulletin Belge*. I inclose you a few drawings, some made at the time, of the full size. The great similarity will doubtless strike you, but the arrangement is made much less bulky than the one you illustrate, occupying one-half less of space. The drawing marked C, which was made twelve months ago, shows exact size of a camera to hold one dozen quarter plates, and the arrangement for registering the position of each plate. The drawings A and B were made four years ago; V shows a similar camera made to fold up to half the size when not in use, and by means of a rapid screw motion to admit of the adaptation of lenses of various focus. This was for 7½ by 4½ plates, and is represented as closed for focussing, the ground glass being in position, and the shutter preventing any light from reaching the plates. This I had partially constructed in 1878, but forget for the moment the maker's name.—Yours, &c.,

W. B. Woodbury.

REDUCTION OF OVER-PRINTED PROOFS.

Dear Sir,—Mr. William Brooks claims priority of publication over Mr. W. England anent the above subject in last week's Photographic News. The method of treating over-printed proofs with cyanide of potassium is a very old one, and I used cyanide in conjunction with chloride of gold as far back as 1864 or '65. You will find the receipt in a communication to the French Photographic Society, by M. Faure, in the Photographic News of August 12th, 1864, vol viii., page 390. In the paragraph further on, a still earlier date is mentioned, viz., 1855 The date, however, is a small matter.

I would strongly advise the use of the gold with the cyanide, and not the latter alone. The following is the receipt:—Water, 7 ounces; cyanide, 5 grains; to which is added two fluid ounces of a solution of chloride of gold of the strength of 1 per 1,000.—Yours truly,

George Lewis.

OVER-PRINTED PROOFS.

Dear Sir,—In the number of the Photographic News of May 27th, you published an article headed "Reduction of Over-printed Proofs," by W. England. Perhaps I may be able to give Mr. England and other readers of your valuable journal some further information on that subject

In the reducing solution used by Mr. England, the prints have to remain immersed for an hour; but in the one used by me, they are only immersed for two or three minutes, or even less, according to the amount of reducing they require.

The formula used by me for the last two years is as follows:—A saturated solution of common salt, four to six grains of cyanide of potassium, and two drops of liquid ammonia ·880. I have used this formula, as I have before said, for two years, and during that time have had no prints wasted through over-printing. Like Mr. England's formula, it does not alter the tone of the prints.—Yours most truly,

Herbert H. Harding.

Dear Sir,—I had not seen Mr. Brooks' communication, nor was I aware that he had published a method of reducing over-printed proofs. I am away from London a considerable portion of the year, and during that period do not read the journals, which must be my apology for not seeing the matter in question. There is no novelty in the use of cyanide to make dark prints lighter, but the only novel point I called attention to was using it in an extremely weak state, namely, four drops to a pint of water; with more it had always failed. Will Mr. Brooks kindly tell me in what journal I shall find his paper? I have searched, but without success.—I remain, sir, yours faithfully,

W. England.

GELATINO-BROMIDE AT A DISCOUNT.

Dear Sir,—I have been trying for a long time past to make gelatine emulsion dry plates. I have tried the formulas by Dr. Eder, Captain Abney, Bedford, and others. I have boiled all sorts of time, from twelve minutes to one hour; have sometimes used ammonia in the emulsion, and sometimes washed in bichromate of potash as recommended by Captain Abney and others. I have developed with pyrogallic and ammonia of every conceivable strength, also with the oxalate. My cooking apparatus is specially made, and faultless; and chemicals the best that money can buy. My negatives develop beautifully, but, when fixed, are a fine ruby pink by transmitted light, and an almost opaque green by reflected light. I have read the Year-Book, and all I can find on the subject, but can get no clue to the causes of the complaints my plates suffer from. Can you help me, or will any of your numerous correspondents give me a helping hand out of this difficulty? I have made twenty-five lots, trying everything I can find published. Hoping you will be able to assist me, I remain, dear sir, yours truly,

Thick Head.

[Perhaps the one thing needful is care in working.—Ed.]

Proceedings of Societies.

South London Photographic Society.

The ordinary monthly meeting of this Society was held on Thursday, June 2, at 8 p.m., in the rooms of the Society of Arts, Adelphi, Rev. F. F. Statham, M.A., President, in the chair. The minutes of the preceding meeting having been read and confirmed,

The Chairman stated that the committee had arranged for two out-door meetings to be held during the recess, that on July 30 at the "Greyhound," Dulwich, and August 20 at Kew; but that further particulars would be sent to each member. He also stated that if the members of the Photographic Club who met on Saturdays for an outing could arrange those dates for the same place, the Society would be very glad to see them.

The President then announced, as the subjects for the artistic competition during the recess, "Good Bye," "The Pitcher at the Fountain," "Our New Baby."

Mr Archer Clarke then read a paper on "Hot Weather Emulsion and the Development of Gelatine Plates" (see page 272), and showed his apparatus and method of making emulsion.

The apparatus, as the Chairman remarked, consisted of the ordinary things utilised.

Mr. W. B. Bolton asked Mr. Clarke if he found that a greater amount of sensitiveness could be got by boiling, or the addition of ammonia; also if the gelatine was left long in the Brawn pressing machine it affected the gelatine.

Mr. Clarke, in reply, said he could not say anything definitely as to the sensitiveness, and he had never left the gelatine long in the Brawn press.

Mr. Brooks said that to avoid long draining the best method was to place the gelatine in a piece of close cambric and wring out, and this gentleman then handed to any who desired it a copy of the rules for the Cornwall Exhibition to be held in August, and further stated that the Art Union Committee would choose from the paintings, water colours, and photographs.

Mr. Archer Clarke then proposed to read a paper at the October meeting, on "Developers and Development of Gelatine Negatives."

There being no other matter to bring before the members, the meeting adjourned.

Edinburgh Photographic Society.

The eighth ordinary meeting was held in 5, St. Andrew Square, on Wednesday, the 1st inst., Mr. W. H. Davies in the chair.

The minutes of last meeting having been read, approved, and signed,

Mr. Arthur P. Lawrie read a paper entitled, "A New Mercury Intensifier," the joint production of Mr. Cosmo I. Burton and himself (see page 269).

Mr. Tunny thought the ordinary intensifier, if properly understood, the best one in use, it being easily worked. He acknowledged, however, that possibly there might be something in the new method which would be valuable.

In answer to a question put by Mr. Tunny,

Mr. Lawrie said the great advantage in his method was, that the chloride of silver was not affected by the light. If the process is repeated, it would darken.

Mr. **Anderson** asked if that intensifier was used for gelatine plates only.

Mr. **Lawrie** answered that there was a possibility of using it upon any sort of plate.

Mr. **Turnbull** thought that the intensifier was a thing that ought not to be needed, as it was only the result of carelessness when it was wanted. He certainly objected to the use of mercurial intensifiers. The best way was to put the negative into a weak solution of iodine. Copper had been greatly used for some time. He thought that Mr. Lawrie trusted too much to the light than to anything else. Bromide of copper, which was in vogue a great deal some years ago, was much better. He could not, however, speak with authority on the point, as he knew very little about the subject.

Mr. **Davies** said that, as the method was entirely new, they would require to look carefully into it before pronouncing judgment. The best way was to have the subject brought before the Society through its Transactions, and, after publicity was given to it in the pages of the Photographic News and Journal, it could be again taken up at the Society's next meeting in October.

Mr. **Turnbull** suggested that some of the members might, perhaps, bring a few negatives with them, and try the experiment before the Society.

Mr. **Neilson** proposed a vote of thanks to Messrs. Burton and Lawrie for having brought something so very novel before the notice of the Society. Novelties were far better, he thought, and much more interesting, than the more hackneyed subjects.

The vote was heartily responded to.

The **Secretary** next exhibited a new stereoscope, invented by Mr. W. Harding Warner, of Bristol, and explained its advantages. Several upright panoramic slides—5½ by 3— were shown. The apparatus was carefully inspected, and the workmanship was considered very perfect; the apparatus itself appeared to fulfil all the conditions claimed for it by the inventor.

Dr. **Hunter** also exhibited a series of photographs and sketches of Indian subjects.

The **Secretary** intimated that the annual picnic would take place on the 7th July, and that arrangements connected with it were in progress. Due notice would be given to the members when these were completed.

A vote of thanks was given to Mr. Davies, and the meeting terminated.

BOLTON PHOTOGRAPHIC SOCIETY.

The May meeting was held on the 5th ult., Mr. **Thomas Parkinson** in the chair.

The following places were selected for out-door meetings during the summer: Rivington, May 14th; Gisburn, June 4th; Worsley, July 2nd; Clapham, August 13th.

Mr. **John Taylor**, Jun., exhibited several interesting negatives taken during the Easter holidays.

A communication for Mr. H. Warner, which had been considered at the Council meeting, was answered as follows:

To the first query—Yes. To the second—Yes. The third—This is merely a question between buyer and seller. The buyer would certainly expect to have delivered to him what he had bought—*i.e.*, either the exhibited sample, or a *fac simile* of it.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

On June 1st, the Board of Management held its usual monthly meeting at 181, Aldersgate Street.

The minutes of previous meeting were confirmed.

Messrs. J. M. Powell, H. S. Parsons, T. P. Sugton, and H. J. Goffin, were duly elected members.

The correspondence and other matters having received the attention of the Board,

The meeting adjourned until July 6th, at 8 p.m.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday, June 14, at the Gallery, 5A, Pall Mall East, when (besides other matters to be brought forward) Mr Francis Galton, F.R.S., will read a paper on "Composite Portraiture."

Ballooning.—Mr. Cobb made an ascent on Monday evening last, from the Alexandra Palace; although the weather was scarcely favourable, he managed to expose several gelatine plates by means of a camera and instantaneous shutter he carried in the car with him.

Royal Observatory, Greenwich.—The Astronomer-Royal says, in his Annual Report of the 4th June:—"Between 1880, May 9th, and 1881, May 13th, photographs of the Sun were taken on 149 days, and of these 284 have been selected for preservation. There are only 8 days out of 149 days on which the Sun's disc was observed to be free from spots, whilst in the preceding year there was a complete absence of spots on 64 days out of 145. The number of hours of bright sunshine, recorded with Campbell's Sunshine Instrument, during 1880, was 1,214, which is about the same as the average of the four years for which we have a record."

London Stereoscopic Company *v.* Tuck—Downey *v.* Same.—The plaintiffs in these two actions sought to restrain the defendant from copying photographs of the Queen, Prince of Wales, and Princess Louise. In asking for a postponement to afford an opportunity of answering affidavits, counsel for the defendant stated that he had a good case. He denied that he had copied the plaintiffs' photographs, and stated that, in fact, the copies, the sale of which the plaintiffs were trying to prevent, had been taken from an original picture painted by a German artist some years ago. Plaintiffs' counsel explained that the way the thing had been done was that the original photographs had been sent over to Germany, where an artist was brought in to look at them, and then the "original picture" was painted by him from memory. This account of the process of production was entirely denied on behalf of the defendant; but the denial was met by the further statement that it was impossible that her Majesty's picture, at all events, could have been painted as an original by the "German artist," as the Queen had never, as far as was known, had such a painting of herself executed. Mr. Graham Hastings, Q.C., appeared for the plaintiffs; Mr. Pearson, Q.C., for the defendants. After further conversation, the matter was allowed to stand over to next sittings, the defendants undertaking to keep an account of sales.

How the Camera Changes Colours.—"The question is often asked," said an experienced photographer "why actors and actresses take the most pleasing pictures? It is because they study the principles of art and good taste in their profession, and understand how to dress. Moreover, they usually bring a selection of veils, flowers, curls, braids, laces, and sometimes costumes, to give the photographer a choice of accessories. They come when they are wholly at leisure, and are not flustered. A red face takes black, and they know it. Then they do not load themselves down with gewgaws and haberdasheries, to show what they have got in worldly goods. Few persons know how to dress for a picture like an actress. The best materials for ladies to wear when about to sit for a photograph are such as will fold or drape nicely, like reps, winceys, poplins, satins and silks. Lavender, lilac, sky blue, purple, French blue take very light, and are worse for a picture than pure white. Corn colour and salmon are better. China pink, rose pink, magenta, crimson, pea green, buff, plum colour, dark purple, pure yellow Mazarine blue, navy blue, fawn colour, Quaker colour, dove colour, ashes of roses, and stone colour show a pretty light grey in the photography. Scarlet, claret, garnet, sea green, light orange, leather colour, light Bismarck, and slate colour take still darker, and are excellent colours to photograph. Cherry, wine colour, light apple green, Metternich green, dark apple green, bottle green, dark orange, golden and red brown, show nearly the same agreeable colour in the picture. A black silk always looks well, and it takes well if not bedecked with ribbons and laces that will take white. Dark Bismarck and snuff brown usually take blacker than a black silk or satin, and are not easy to drape. A silk, because it has more gloss and reflects more light, usually takes lighter than a woollen dress. Ladies with dark or brown hair should avoid constrasts in their costumes, as light substances photograph more quickly than dark, and ladies with light hair should dress in something lighter than those whose hair is dark or brown. Few ladies understand how to arrange their hair so as to harmonize with the form of the head, but blindly follow the fashion, be the neck long or short, or the face narrow or broad. A broad face appears more so if the hair is arranged low over the forehead or is parted at the side, and a long neck becomes storklike when the hair is built up high, while a few curls would make a most agreeable change in the effect. Powdered hair gives good effect, and powder should be bestowed upon freckles."

Engravings and Photo-engravings.—An the County Court before Mr. J. F. Collier, an action was brought by Mr. G. F. Sargent, for the recovery of seven guineas from Mr. E. S. Braddyl, the amount being the price of a proof copy of the picture known as the "Liverpool Flags," for which the defendant had subscribed. Mr. Kennedy was counsel for the plaintiff; and Mr. Segar for the defence. In opening the case, Mr. Kennedy remarked that it involved a point of a curious nature. In 1878 the plaintiff, who was a painter of position, came to Liverpool to do a representative picture of the celebrities of Liverpool. Having opened a studio here, a number of gentlemen attended, and had their portraits taken for the purpose of being introduced into the picture. The defendant was one of them, and became one of the subscribers for a proof copy, the contract for which he signed at the studio. Mr. Sargent had done a similar picture of the House of Lords and the House of Commons, and at present occupied a studio in the House of Commons, three hundred of whom were subscribers to his picture. The picture of the "Liverpool Flags" had been delivered to the defendant in pursuance of the contract, and the objection to pay for it seemed to be on account of the way in which it had been produced, namely, by a cheaper process than ordinary engraving—the application of photography to each subject, and the subsequent aid of chemistry. The process was invented by a French gentleman, named Goupil, and was known as photogravure. It did not dispense with the work of the engraver, but was a much more rapid process, and was cheaper than the ordinary mode of engraving. It was the same process as had been adopted in the reproduction of the pictures of the Houses of Lords and Commons, the price of which was ten guineas each, and no objection had been made to them on account of the process. It was stated in the printed prospectus of the Liverpool picture that the reproduction for subscribers would be by "Goupil's engraving process." Mr. Sargeut gave evidence of these facts, and being asked whether he would speak of the reproduction by the Goupil process as an engraving, he said he would. He had sold over two hundred of the pictures. Mr. Edward Grindley, Liverpool agent of M. Goupil, who was called in support of the claim, described the process, and said the picture came fairly within the description of a copy or proof. He recommended to Mr. Sargent the adoption of Goupil's process for the picture, as being the best for a picture containing a large number of portraits. For a picture of that kind, the process was superior to the ordinary method of engraving, because it reproduced the portraits more accurately. Mr. Segar, for the defence, submitted that a contract for an engraving had been proved, whereas the plaintiff had proved the delivery of an article which was not an engraving. The process was a perfectly new and peculiar one, and the copy was one which the defendant would not expect to receive. The defendant expected to receive an engraving. The Judge: It is an engraving, though not an engraving done by hand; but the word "engraving" is not used in the contract. Mr. Segar: We believed we were to have what is ordinarily understood as a proof copy, or engraving. His Honour: The contract was merely for a copy; but even if the word "engraving" was used, the evidence is, that what the defendant received, was an engraving by a peculiar process. My view certainly is that the contract has been satisfied. The defendant was called, and said that at the time of the contract he had not heard of Goupil's process, and did not remember having read the prospectus. Mr. Segar said he was prepared to call a number of other subscribers, who would state that they expected, like the defendant, that they would receive an engraver's proof of the ordinary kind. His Honour said he was of opinion that even if the word engraving bad been used, the contract would have been satisfied, because the picture was an engraving, though not in the sense ordinarily understood by the public. He gave judgment for the plaintiff for the amount claimed.—*Liverpool Daily Courier*.

To Correspondents.

*** A cheque for two guineas will be given for the best practical essay, "How I Retouch and Varnish My Gelatine Negatives." Contributions must be sent in not later than 1st July. For rules, see previous Nos. of the News.

J. R. White.—1. First soak in cold water for a few minutes, after which immerse in an oxalate developer composed of one part saturated solution of ferrous sulphate, and three parts of saturated solution of potassium oxalate. Wash, soak in alum solution, and fix in hyposulphite. 2. The context shows "a quarter" to have been a misprint for three-quarters.

S. S.—We are glad to observe such a very marked improvement.

E. H. M.—1. The proportion is 40 grains per ounce; more water will be absorbed during the operation of washing. 2. Certainly necessary. 3. It is best to use it promptly; but if a small proportion of alcohol is added, the tendency to decompose is lessened. 4. Slow decomposition in the first case, and diminished sensitiveness in the second.

Hanley.—Some chemical—perhaps bichloride of mercury—appears to have fallen on the paper.

E. W.—The lens you propose to obtain will answer admirably for cabinets; but it is not quite so suitable for groups as the one which you possess. This latter, if stopped down to the same ratio, will give better marginal definition, while the rapidity will be about the same.

Deedy.—Mr Warnerke only alluded to the photographic aspect of the case.

Charles F.—A suitable camera can be obtained from any of the dealers who advertise in our columns. You must not expect, however, to be able to practise photography without taking a little trouble in instructing yourself. Obtain the Year-Book, and Captain Abney's "Instruction in Photography," both published at our office. Many makers of dry plates arrange to give demonstrations of development, &c.

A Beginner.—Our own experience is identical with yours; but the deposited gold need not be wasted, as it is easy to reconvert it into chloride when sufficient has accumulated.

M. Berinoer.—The only way is to practise carefully, and to take note of all circumstances affecting the actinic intensity of the light.

E. D. S.—Not in the slightest degree.

W. E. D. Jones.—Keep the bottle which contains the ferrous sulphate solution well corked.

George McCarle.—Use the solution only while fresh.

T. C.—It is an amido-chloride of mercury, but it will not be formed if you thoroughly wash before putting the plates in the ammonia bath.

T. Harrison.—1. It is instantly bleached by chlorine or hypochlorous acid. 2. Equal parts of a saturated solution and water.

D. C. L.—The addition of a small proportion of ox-gall will remove your difficulty. The prepared ox-gall sold by artists' colourmen is more convenient than the crude article.

Glass.—One of the most effectual methods of removing them is to soak the plates in a solution containing bichromate of potassium and sulphuric acid. Two ounces of the former and four of the latter to a pint of water will answer well.

James S. Morris.—1. It is probable that the extreme slowness with which the plates develop arises from the too liberal use of chrome alum, the films being thereby rendered repellent and hard 2 Such a proceeding is not to be recommended except in extreme cases.

Nemo.—Between 3 and 4 per cent. in ordinary cases.

G. K. Longton.—1. Although fairly good results have been shown from time to time, the process presents difficulties, and, in the hands of most, uncertainties. 2. By the ordinary plaster process. 3. It is impossible to judge without seeing a specimen.

Joseph Martin.—The effects of the barrel-like distortion can be very readily remedied as follows:—Make a contact transparency on a gelatino-bromide plate, and then produce a camera negative from this by means of the lens originally used; but the objective must be reversed—*i. e.*, the stop directed towards the sensitive plate. In the case of the picture taken with a diminishing top, the remedy is similar, the transparency being so tilted as to enlarge the upper part to the requisite extent. Of course a small stop must be employed.

Experimenter.—The phenomenon arises from the presence of a notable proportion of soluble chloride—probably sodium chloride—in the water, silver chloride being precipitated. Make use of filtered rain-water or distilled water.

M. D.—You certainly have nothing to complain of, as most photographers would have acted in a similar manner.

Indignant.—The copyright of a negative taken under the circumstances undoubtedly belongs to the photographer.

Henry L——m.—Insolubility of the tissue has caused your troubles. Among the principal causes may be mentioned slow drying, an acid bichromate bath, fumes from drains, and long keeping of the sensitised tissue.

T. D. Goddard.—The surfaces have become so far disintegrated or corroded by exposure to damp and foul air as to render the instrument useless. An optician could, however, re-polish the glasses.

Evan Williams.—Powdered black-lead, applied with a stump, will answer the purpose well.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1189.—*June* 17, 1881.

COMMISSIONERS OF PATENTS FOR INVENTIONS

CONTENTS.

	PAGE
Planté's Secondary Battery	277
Physiognomy and Photography	278
Shellac in Gelatine Emulsion	279
Development with Ferrous Oxalate. By Capt. W. de W. Abney	279
French Correspondence. By Leon Vidal	280
Photography In and Out of the Studio	281
Notes	282
Topics of the Day—Landscape Studies. By H. P. Robinson	283
Correspondence	284
Proceedings of Societies	287
Talk in the Studio	288
To Correspondents	288

PLANTÉ'S SECONDARY BATTERY.

The gas battery invented by Mr. Justice Grove has long formed one of the most interesting pieces of apparatus shown at lectures on electricity, and this not only on account of the important principle involved in its action, but also because no intelligent student can understand its action without feeling that this apparatus must be the fore-runner of a battery which shall enable us to obtain electricity directly through the oxidation of the ordinary combustible materials of every-day life

The instrument in question consists of two bell-jars, one of which contains hydrogen, and the other oxygen. These stand side by side in a vessel containing dilute sulphuric acid, each of the bell-jars having its open mouth directed downwards. When a platinum plate is placed in each bell-jar, so as to be partly in the gas and partly in the liquid, the battery is complete; and as soon as the platinum plates are connected by a conducting wire, a current passes while the gases slowly combine together, although they are separated by a considerable thickness of acidulated water. When the whole of the gases have combined, which will ultimately be the case if they exist in the proportion of two volumes of hydrogen and one volume of oxygen the flow of the electric current ceases. Let us now suppose that the terminals of the gas battery are joined to the poles of any ordinary voltaic battery capable of decomposing water, or, to speak more accurately, of liberating hydrogen and oxygen from dilute sulphuric acid. The gas reservoirs of the Grove gas battery will gradually become replenished, oxygen being evolved from that platinum plate by which the positive current enters, and hydrogen from that plate by which it leaves. The decomposing battery being now disconnected, a fresh current may be obtained from the Grove gas battery; the positive stream leaving this by the same wire at which it entered. The above-mentioned experiment may be simplified if the Grove gas battery is replaced by a pair of platinum plates placed side by side in a vessel of acidulated water, and when these are connected for a few seconds with the pole of an ordinary battery, one becomes coated with a film of hydrogen, and the other with a film of oxygen. The battery being now disconnected, and the platinum plates connected by a conducting wire, a current flows from the plate coated with oxygen towards the other platinum plate. A pair of platinum plates immersed in acidulated water thus forms the simplest secondary battery, and this apparatus may serve, as above described, to take a charge of electricity from an ordinary Constant battery, and to store this charge up until the polarised platinum plates shall be connected by a conducting wire.

The secondary battery above described is of no practical value as a reservoir of electricity, the first instrument of this kind in which the secondary currents possessed sufficient intensity to be valuable being that of Gaston de la Planté.

In Planté's battery the platinum pole-plates are replaced by lead; and in order to render as much surface as possible available, the two plates are rolled up together into a cylinder, contact between them being prevented by the interposition of a layer of coarse canvas between them. In the case of Planté's battery the oxygen liberated from one plate unites with the lead, forming a peroxide, while the greater part of the hydrogen is probably occluded on the other; and those who have studied the chemical and physical conditions under which voltaic batteries act, will at once see that Planté's battery works to the greatest advantage when the lead plates have become oxidised and corroded, either by repeated use or by other means.

The current from Planté's battery is often much more intense and vigorous than the initial or exciting current, it being, of course, understood that there can be no actual gain of force, as the feeble exciting current must be exerted for a proportionally long time in charging the secondary battery; and as an example of the kind of effect attained by the Planté battery, we may mention that several years ago we saw an electrician in Paris charge six small Planté cells, each being about five inches high, by means of two Bunsen cells of about the same size. When fully charged, the secondary battery melted an iron wire two feet long, and as thick as a knitting-needle; and when again similarly charged, it yielded a brilliant electric arc, which lasted for more than a minute. There can be no doubt that an arrangement of this kind might be extremely valuable for portraiture by the electric light.

Within the last few weeks Planté's battery has been the subject of much discussion, and the advantages of an apparatus of this kind have been prominently brought forward by Faure. This gentleman prefers to coat the leaden plates with red oxide of lead, rather than trust to the corrosion of the plates; but whether the coating thus applied will satisfactorily replace the spongy condition induced by an alternate oxidation and reduction, remains to be seen. Some of the daily papers have been predicting extravagantly great results from the use of secondary batteries, because four cells constructed on the above-described principles, and weighing, with their packing-case, about 75 pounds, stored up an available force of a million foot pounds, and this potential force was transmitted from Paris to Glasgow. The newspaper writers appear to have been influenced by the large look of the word million, and they probably lost sight of the circumstance that in conveying the box several million foot pounds of force were expended, and this circumstance somewhat damps the half prediction that the force of the Niagara

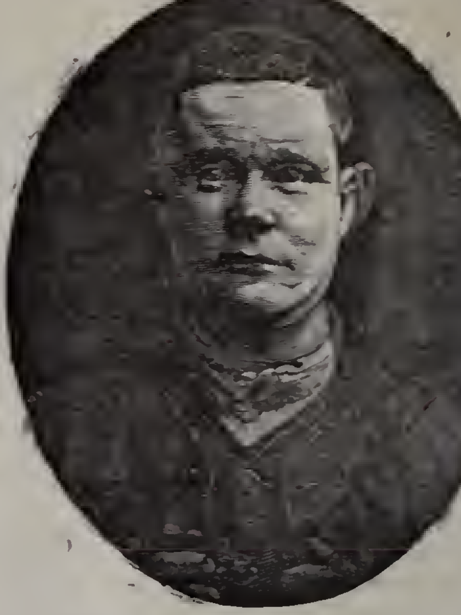
Falls will some day be stored in secondary batteries and conveyed all over the North American continent, if not all over the world. A million foot pounds represents the actual work of a strong horse during a period of rather over half an hour; the force developed by a powerful locomotive in about ten seconds, or the energy produced in actual practice by the combustion of three farthings' worth of coal gas in a gas motor engine.

A practical application of the secondary battery will probably consist in its use for working incandescent electric lamps, such as those of Swan, the charged batteries being taken round to the houses and left in exchange for exhausted ones. It is to be hoped that Mr. Swan will take in hand the study of Planté's battery, as there can be but little doubt that very considerable improvements are possible.

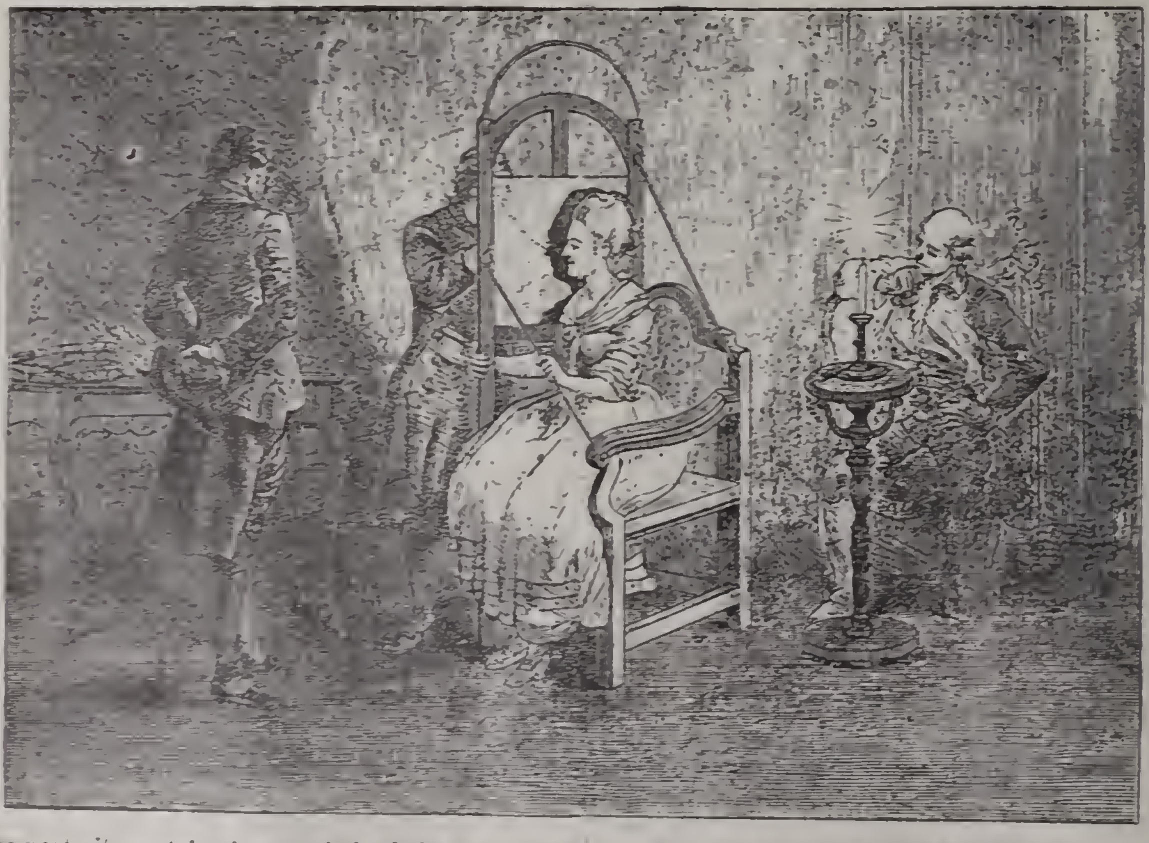
PHYSIOGNOMY AND PHOTOGRAPHY.

Mr. Francis Galton's paper on Tuesday night, on the application of photography to the study of physiognomy, was listened to with rapt attention by the members of the Photographic Society. Mr. Galton, as many of our readers are aware, has for some time past made a study of component portraits, or, in other words, of pictures formed by throwing one after another upon a sensitive plate, the portraits of different individuals. By imprinting upon a collodion or gelatine film the portraits of a whole family, for instance, he secures what may be aptly termed a family likeness. The illustrations of component portraiture Mr. Galton exhibited were exceedingly striking; notwithstanding the many superposed images, it was difficult to imagine that not one, but many individuals had served to produce the pictures.

We have here a representation of one of Mr. Galton's components made up from three portraits of different criminals. The print from which the engraver worked was regarded by competent judges as a fair average, giving no undue prominence to either factor; but the wood engraver, although he had never seen either of the three original pictures, unconsciously gave too great weight to one of them. This circumstance is a striking illustration of the remarkable manner in which features may lie latent in a composite portrait, certain characteristics being especially obvious to one person; while a second observer takes more note of another set of peculiarities. Just in the same way, it often happens that the resemblance of a child to its father is obvious to one observer, while another person can only trace the maternal features.

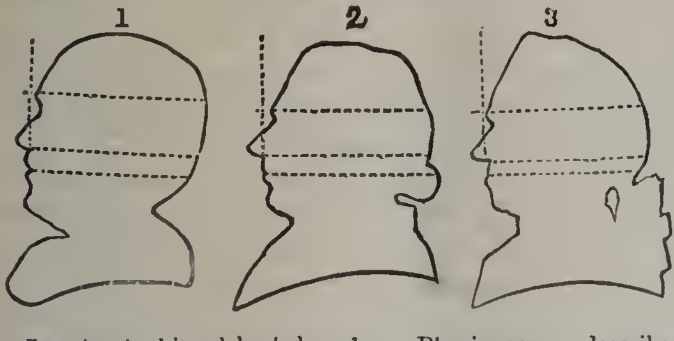


Mr. Galton's experiments remind one forcibly of Lavater's, except that Mr. Galton's does not, of course, pretend to deduce from his pictures that which Lavater claimed to find out. Lavater also used light in taking his pictures, or silhouettes, as they are termed.



We have secured a copy by means of the phototype or photo-etching process of an engraving of 1783—nearly one hundred years old, therefore—which cannot fail to interest photographers. Silhouette making was very popular just before photography asserted itself, and there are few households in which specimens of these little black portraits are not to be found.

Our engraving is taken from the *Scientific American*, which, quoting from *la Nature*, says on the subject :—



Lavater, in his celebrated work on Physiognomy, describes it as an accurate and convenient machine for drawing silhouettes. The engraving represents the apparatus so well that it is not necessary to enter into a minute description of it.

"The shadow," says Lavater, "is projected upon a fine paper well oiled and dried, and placed behind a piece of plate glass, supported in a frame attached to the back of the chair. Behind this glass the artist is seated ; he holds the frame with one hand, and draws with the other."

The proportions of a silhouette, on the authority of Lavater, must be judged principally from the length and breadth of the face. "A correct and well-proportioned profile should be equal in breadth and height. A horizontal line drawn from the point of the nose to the back of the head (provided the head be erect) should not exceed in length a perpendicular line which extends from the top of the head to the junction of the chin and neck. All of the forms which deviate sensibly from this rule are so many anomalies."

In support of these observations Lavater gives a number of specimens of silhouettes, and insists upon the conclusions which he deduces from their study. We give three of these specimens. In No. 1, Lavater sees an upright soul, an even temper, taste, and frankness ; in No. 2, the contour of the nose carries the infallible mark of a good temper ; in No. 3, we have clearness of judgment. The science of physiognomy appears puerile to us. It may have afforded an agreeable recreation, but nothing more, in a scientific point of view. Lavater nevertheless obtained a great success in Europe. A crowd of persons flocked to Zurich to see the celebrated philosopher, and demand of him the secrets of their character, and even of their destiny. Lavater, with uncommon sagacity, was seldom deceived in his judgments ; it was thus that he divined the characters of Necker, Mirabeau, and Mercier. The impartial historian must acknowledge that if the work of Lavater is vague, undecided, and sometimes errs in the domain of the imagination, Lavater himself was a man of lofty spirit, faithful to the grand principle of morality. With the idea of unmasking character, and opening the human soul, as one would a book, to inquire into its depths, he produced a great sensation among his contemporaries.

◆

SHELLAC IN GELATINE EMULSION.

A little while ago we noted the fact that Herr Wilde, of Görlitz, used a gum resin in emulsion making. We have now his paper before us, and can give our readers an account of the plan Herr Wilde pursues in preparing his gelatino-bromide emulsion.

In his belief it is well to employ alcohol freely. A quick-setting and uniform material is best prepared, he thinks, by using only enough water to bring about the solution of the gelatine, and then making up the difference with alcohol. He dissolves his potassium bromide and nitrate of silver in boiling alcohol, and then adds to it the fluid gelatine, which, as we have just said, contains a goodly proportion of alcohol. The maturing or cooking may be conducted at a high temperature—above boiling point even —without the gelatine becoming decomposed, or exhibiting any tendency to give a fogged film.

The washing is allowed to go on for a period of from sixty to seventy-two hours in running water, and, according to Herr Wilde, a regular metamorphosis between the alcohol and the water then ensues ; if the change is not complete, the emulsion will not flow evenly over the glass plates. Despite the long washing, a firm and quickly-drying emulsion results, and, what is of most moment, it keeps good for a considerable time, even in summer, without the addition of any antiseptic.

The addition of a gum resin, or rather shellac, not only adds to the stability of the emulsion, but improves the film for retouching purposes. A solution of bleached shellac in alcohol is prepared, and this is added after the cooking, but before the operation of washing. With resin, the film dries quicker and smoother, while the sensitiveness is in no way impaired. The negative when unvarnished has the appearance of fine matt glass, and may be retouched without the application of any medium. Moreover, Herr Wilde tells us that the quality of the negatives, in portraiture especially, is improved.

Some sorts of gelatine, we are also informed, which do not give satisfactory emulsions under ordinary circumstances, do so on the addition of a little shellac dissolved in alcohol.

◆

DEVELOPMENT WITH FERROUS OXALATE.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

On all sides I find that the ferrous oxalate developer is tabooed, and the reason that is generally assigned is, that unless you give exactly the right exposure, the negative is not what it should be. People have got this fancy into their head—and it is a mere fancy—and it is my aim to try and show that development with this splendid developer (for to my fancy it is splendid, giving such beautiful negatives to look at, and to print as well as they look, which is usually more than can be said for an alkaline developed negative) is quite under control. In order to elucidate the procedure I adopt, let me take as an example a case which happened recently to myself. Eight plates were exposed, but what the plates were, whether rapid or slow, I was not aware at the time, since, owing to negligence, they were unnumbered with the sensitometric number. I therefore determined to expose all as mediumly quick plates, *i.e.*, plates that would read on Warnerke's sensitometer 18 or 19 ; and exposure was given accordingly.

Now, the question arose how to develop these plates. I was sure that in the eight there were three batches of plates, some slow and some very rapid. To begin with, fresh ferrous oxalate was prepared, and the preparation did not take very long, about ten minutes to a quarter of an hour. Into boiling water neutral potassium oxalate was thrown, and a saturated, or very nearly saturated, solution resulted in a couple of minutes. The liquid was poured off into a glass flask, and was fairly cool owing to the solution of the oxalate. The ferrous oxalate in powder was next thrown in, so as to be in excess, and well shaken for a couple of minutes, and cooled a couple of minutes more under the tap. It was allowed to settle, and then filtered off into two-ounce bottles, four drops of strong sulphuric acid being put into each bottle. Three cups stood in readiness in the developing room, and two were filled with two ounces of the solution, and the other with one ounce, which was made up to two ounces by the addition of water.

To one (No. 1) of the strong solutions half an ounce of a twenty-grain solution of potassium bromide was added, and to the other (No. 2) one drop. The first plate was placed in the developing tray, and No. 2 poured over it ; the image began to appear very rapidly, say in about six seconds. The developer was instantly poured back into the cup, and No. 1 poured over instead. The detail still put in an appearance slowly, but vigour and density were gradually given, and after a short time the plate was fully developed. It was washed and fixed, and turned out a really capital negative. My assistant informed me afterwards that this was a rapid plate which he had put into the slide. With ordinary development it would have been ruined, but the bromide with the ferrous oxalate suited it.

Two other plates behaved and were treated in the same manner.

Another plate, however, behaved quite differently. After an application of No. 2, it came out slowly, some fifteen seconds elapsing before the sky-line and general features made their appearance. The question was, how to treat the negative, and it was no sooner asked than answered. A couple of drops of hyposulphite of soda were dropped into the cup, and the developer poured on to it, and again poured over the plate. The detail at once flashed out, and after a little working it was poured off, and the weak developer applied. Density was gradually attained, and though not the very best of negatives, still is very fair, and yields good prints. Another plate, treated in the same way, yielded a better result, having had a trifle longer exposure. These plates were the two slow plates which I happened to have in my slides.

The medium rapid plates were all well exposed; and in two instances, where it appeared that sufficient detail was out, No. 1 was applied, and the remaining density got with it. Another sample of plate is one which is apt to give too dense pictures; in that case the weaker solutions are used throughout. A plate having a very thick film I invariably finish with the weak developer, since it makes it more harmonious. As I have often written before, when most persons would think sufficient density is acquired with ferrous oxalate, the development should be still continued for a short time longer, since those accustomed to alkaline developers are bad judges of what printing density is when using the ferrous oxalate. The finished negatives have much more the characteristics of wet plates than anything else, and there is no deception caused by the colour of the deposit. It is black, or very nearly so. Another point is that you are never troubled with bubbles on the film, as is so often the case in the glycerine developer. All is plain sailing as far as development is concerned. I would remark that very slight deposits of calcium oxalate, caused by the wash water, are removed in the alum bath, and the dried negatives have no dusty deposit which used to be seen in the earlier samples of negatives developed by this developer.

FRENCH CORRESPONDENCE.

Astronomical Photometry—Visit to the Meudon Observatory—Benzoate of Iron Developer—Theographie—Graphotype by M. Dubois—Employment of Celluloid in Photography—M. Londe's Instantaneous Shutter and Support for Pellicle—Improvement in the Production of Celluloid Plates.

Astronomical Photometry.—At the last meeting of the Photographic Society of France, M. Janssen read a highly-interesting paper on astronomical photometry, a subject which he had already brought before the Academy of Sciences. Our illustrious astronomer has succeeded by means of photography in measuring the radiant energy of a large number of heavenly bodies by comparison with the radiant energy of the sun. He has found that the action produced on sensitive films by the radiation of different bright stars could be registered photographically in such a way as to render it possible to compare with one another the more or less rapid impressions taken in the camera, and to verify the relations which exist between various radiating energies by taking account of the length of the exposure necessary for giving impressions of equal intensity. In order to make his experiments in this direction sufficiently accurate, he has been compelled to regulate with great precision the movement of his instantaneous shutter, so as to be able to obtain and to measure exposures of $\frac{1}{20000}$, and even of $\frac{1}{40000}$ of a second. He succeeds in measuring these extraordinary velocities by means of a tuning fork, whose vibrating prong describes a waved line on a blackened surface. The aperture of his shutter is triangular, so as to give, not a uniform tint, but a graduated tint which constitutes a scale of colour, from the different shades of which may be selected, after two different experiments, those which present the same intensity. The shutter is made to have a perfectly uniform velocity during the whole duration of its passage; and as it can be placed in very different positions according to the situation of the lens, it is balanced in such a way that its weight is compensated in every position in which it was placed. M. Janssen, in investigating the principle on which his photometric experiments are based, has been led to observe that the deposit of reduced metal must not be too opaque; it must, on the contrary, be very thin, so as to render it possible to compare with one another very light tints, because beyond a certain point the increment of opacity is not proportional to the duration of the action. The intensity of the radiating energy is therefore measured by the comparison of equal intensities, and by checking the time required for producing them. In this way M. Janssen has succeeded in reproducing certain bright stars, such as Sirius, and in establishing the relation between the radiating energy of this star and that of the sun. From these observations it results that (to take a familiar example) if with the light of the sun it requires a second of exposure for taking a landscape, it would require, for taking the same photograph by the light of Sirius, an exposure of 63,000 years. Notwithstanding this enormous difference between the energies of the two stars, M. Janssen has been able to take photographs of Sirius with an exposure of not very long duration. It must, however, be recollected that he has photographed the luminous body itself, and not objects reflecting the rays emanating from this body—very different things.

Visit to the Meudon Observatory.—The great interest of this communication of M. Janssen induced me to go and observe for myself more closely his work. I therefore repaired to Meudon, where, in a magnificent situation, his special observatory is established. There I saw some beautiful photographs of the sun, 30 centimetres in diameter, on which can be studied with great clearness all the details of the granulations. At regular intervals, whenever it is possible, photographs are taken of the sun, so that a considerable collection of solar photographs has been formed. This collection is at the disposal of scientific men of all countries, for making such investigations as they may think necessary. Before the introduction of this special kind of photography, solar observations presented very great difficulties. An impression, however rapidly it might have been taken, could only render a number of images superposed one on the other; but, thanks to M. Janssen's extremely short exposures of a few thousands of a second, we are able to make the sun inscribe automatically a representation of its own surface, giving an accurate and very pure image, which must be quite above all misconception. There is seen marked on it with great fidelity, not only the network of motionless granulations, but also portions of the surface actually in motion; they look like snowflakes driven in every direction by currents of air. It is supposed that this effect, so clearly visible on one of the Meudon solar photographs, is produced by currents of hydrogen, which pass across the sun's surface in every direction. It is quite impossible to foresee whether there is any limit to the increase of regularity and accuracy of observations obtained by employing the photographic eye, an instrument which is much more penetrating than the natural organ of observers, to however great a pitch of perfection the other means of observations may have been brought.

Benzoate of Iron Developer.—M. Borlinetto has been experimenting with a new developer for gelatino-bromide plates. This developer consists of benzoate of iron, a compound which, as he says, has not the energy of succinat of iron, but which is less liable to oxidise by exposure t the atmosphere. It produces images of great delicacy formed on the outer surface of the sensitive film.

Theographie.—Last year photography played a part in a grand fête given at the Grand Opera. Now it has again found a place in a fancy fair got up in the Tuilleries Gardens for the benefit of the sufferers by the earthquakes at Chios, and of a "Society of the Friends of Childhood." A tent was set apart for photography, where it had been arranged that Sarah Bernhardt, in conjunction with Pierre Petit, should be the photographic artist; but as she had been obliged to fulfil an engagement in England, her duties were transferred to Mademoiselle Théo, a lovely and talented actress, and a great public favourite; hence the title—*Theographie.* Five francs is the price of a dozen of these *Théographie* cartes. The electric light was employed for taking these photographs, and the process was probably that of ferrotype, for the prints could be carried away as fast as they were executed. The idea is an ingenious one, and will probably often be called upon to render services on similar occasions.

Graphotype by M. Dubois.—At the same time that the photographic journals were publishing Luckhardt's process of photographic engraving (this process will be found described in the PHOTOGRAPHIC NEWS of June the 10th, page 267) M. Dubois, of Tours, sent me some prints produced by very nearly the same means, the only difference being that M. Dubois employs a positive in place of a negative. With this difference the method of operation is quite the same, and provided that the operator is used to work with a point, and knows something of drawing, he will soon be able to produce prints which can be easily transformed into engraved plates, either intaglio or in relief. M. Dubois, who is an artist by profession, has succeeded very well with this process; his first proofs are now being exhibited at Tours. I am under the impression, however, that it would be better to use dry collodion positives than gelatino-bromide plates, on account of the resistance which gelatine offers to working with the point.

Employment of Celluloid in Photography.—Celluloid is making its way as a photographic medium. M. Fortier, by graining it with pumice moistened in oil, has produced plates which can be substituted for the ground glass of the camera in case of accidental breakage. M. Londe, on the other hand, has endeavoured to make celluloid plates more transparent by washing their surfaces with acetic acid, that being a solvent of the substance. Unfortunately, this is liable to produce buckling in the plates, which is afterwards difficult to correct; it is better to try to obtain very white celluloid, as recommended by M. David.

Instantaneous Shutter by M. Londe, and New Support for Pellicle by the same.—Instantaneous shutters continue to occupy public attention. M. Londe has devised one which has much analogy with that of Mr. Cadett, only it is placed in the interior of the camera on the slide which carries the lens. Outside there is only seen a small dial-plate near the lens, by means of which the shutter may be regulated to any required degree of velocity; the spring can be more or less tightened, and a hand on the plate indicates the degree of tension which has been obtained. M. Londe's shutter is circular, and by the arrangement which he has devised the inconvenience peculiar to an apparatus placed outside the camera and in front of the objective is avoided; his shutter is situated inside the camera and behind the objective. The same gentleman has also originated a plan of coating plates with a mixture of gelatine and glycerine whitened with sulphate of baryta, to form a temporary support for any kind of pellicle which has to be coated with a sensitive substance, and is to be kept for a time in a perfectly level state. The following is the formula of his mixture:—

Gelatine	50 parts
Sugar	50 „
Barium sulphate	115 „
Glycerine	300 „
Water	190 „

Improvement in the Production of Celluloid Plates.—M. David continues his attempts to improve his celluloid plates with great success. At the last meeting of the Photographic Society he showed some small plates of this substance very thin, very smooth, and very transparent. This kind of support, thin though it is, is so firm and solid that it cannot fail of being found useful for photographic operations.

LEON VIDAL.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

REDUCING OVER-PRINTED PROOFS—GELATINE A PHOSPHORESCENT BODY—MAKING NITRATE OF SILVER FROM DOLLARS—SENSITIVENESS OF DIFFERENT SILVER SALTS TO LIGHT—A NEW INTERNATIONAL CONFERENCE—ARRANGEMENTS IN INTERNATIONAL EXHIBITIONS—INCREASING THE SENSITIVENESS OF MODERN DRY PLATES.

Reducing Over-Printed Proofs.—Mr. W. England gave in our last issue a sketch of his method of reducing the intensity of over-exposed prints, by means of cyanide of potassium. As may be gathered from our correspondence columns, this method has been in use for some years, but the colour of the prints so reduced is a little changed towards a grey tint by the influence of the cyanide. There is another method, a little less convenient, but without influence on the colour of the picture, which consists in the application of iodine. One grain of iodine and one grain of iodide of potassium to ten ounces of water will give a reducing solution which acts on the picture by the formation of iodide of silver. This compound must be removed afterwards by the immersion of the print in the usual fixing bath.

Gelatine a Phosphorescent Body.—Laoureux observed that an exposed gelatino-bromide plate placed in the dark on another unexposed plate, so that one film touches the other, or even when these are separated by an interval of half a millimetre, transmits to the second plate an impression of light, so that both plates give with any suitable developer pictures of nearly the same intensity. Pizzighelli, in Vienna, repeated the experiment, but without any success, and Laoureux confesses now that he has lately also repeated the experiment without success. Dr. Eder believes that the reason why this succeeded sometimes, and sometimes not, is the phosphorescence of the gelatine. That gelatine is often phosphorescent is already established, and it may be that samples differ greatly in phosphorescent qualities, so that an experiment made in this way may only occasionally succeed.

Making Nitrate of Silver from Dollars.—Remelé, a well-known landscape photographer, when on his Pacific trip, adopted a cheap and convenient method of making nitrate of silver, and details may be of value to our colonial readers. Remelé tells us that in Southern America he must pay 34 dollars a pound for silver nitrate, while he can make the same quantity with 16 dollars. The method he employed was as follows: Dissolve the coins in nitric acid, and then evaporate to dryness, without fusing the salt. Next soak the dry nitrate with six successive portions of spirit. This removes in a very complete manner the nitrate of copper which is contained in the salt. The nitrate got in this way is suitable for all negative and positive work. The alcoholic solution of the nitrate of copper contains a little silver, but it can be precipitated by a strip of copper.

Sensitiveness of Different Silver Salts to Light.—In our issue of May 27 we remarked that the white bromide of silver, although less sensitive to light, is more easily reduced by the alkaline developer than the green bromide. We said: "Anybody would assume that the form most readily reduced by chemicals must also be easier to reduce by light, but we see that this is not the case. Another instance of this is pointed out by Dr. Eder in his communication on chloride plates. Chloride of silver is more easily reduced by chemicals than bromide, although the latter is much more sensitive to light; indeed, according to Eder, it is fifty times as sensitive. Eder also raises another interesting point with regard to the quantity of light necessary for producing a good negative on a bromide plate, and that required for giving a fully-exposed positive print on chloride of silver. In the latter case from eighteen to forty-five thousand times more light is necessary than in the former. The difference is a remarkable one, but Eder has not determined how much light is necessary for the production of a positive print on the ordinary photographic albumenized paper, which contains not only chloride of silver, but also nitrate and organic matter. Dr. Vogel made experiments in this direction about a year ago, and observed that for producing a good copy on albumenized paper, twelve thousand times more light is necessary than for making a corresponding negative on a gelatino-bromide plate.

A New International Conference.—The Syndical Assembly of Ghent has instituted a new international competition, which we think is rather singular. The Assembly offers three different prizes, for a series of at least a dozen views representing prominent buildings of the city of Ghent. The directors invite not only the Belgian, but also foreign photographers to compete. Here is a good opportunity for some of our travelling photographers to take a trip to the fine old city of Ghent, rich with the quaintest and most heroic associations. The Assembly requires that the prints should be made in carbon, collotype, or Woodburytype; and we may mention here that carbon printing is very popular in Belgium, perhaps more so than in many other parts of Europe. All prints for the competition must be sent in before the 20th of August.

Arrangements in International Exhibitions.—The *Diritto*, an official Italian periodical, writes that it is proposed to hold an international convention on the arrangements of international exhibitions in the various countries. Something of this kind is really necessary in regard of the fact that France has held two international exhibitions since 1867; that America intends to arrange one in New York, though only five years have passed since the Centennial; that our brethren in Australia hold two international exhibitions in two years; whilst England has had none since 1862. Professor Hofmann, the celebrated chemist, says, "We live in a time afflicted with exhibition-fever." Certainly, a cure is necessary. Photographers especially have reason to desire it, as they are always welcome for decorating empty walls, but in general they have only expenses from exhibitions, without much advantage. Any other branch of art or industry can hope to open a new business by international exhibitions. The majority of photographers, especially the portraitists, don't get more than perhaps a medal or honourable mention. The local exhibitions are of much greater advantage to them.

Increasing the Sensitiveness of Modern Dry Plates.—There are different methods of getting highly sensitive gelatine plates, as, for example, keeping the emulsion some days at a temperature of about 100° F.; cooking about half an hour; preparing the emulsion at a high temperature, say at 150°F.; ripening by time at a low temperature; introduction of ammonia. Some of the different methods are a little dangerous by reason of their influence on the gelatine, this compound being easily decomposed. The methods standing third and fourth are certainly the least dangerous in this respect, but they require time. In the old collodion emulsion process, the presence of sensitisers and organifiers was of very considerable importance, but it seems that in the case of gelatine plates, these accelerators do not possess the same remarkable influence; but, nevertheless, Dr. Vogel has observed that pyrogallic acid exercises a favourable action on gelatine plates. Nitrate of silver cannot be used, as it causes red fog. Vogel has tried this with better success on collodio-gelatine plates, and three drops of an alcoholic silver solution, containing five grains per fluid ounce, added to five c.c. of collodio-gelatine emulsion, increased the sensitiveness; but after a day this favourable action was no longer observable, because the nitrate was decomposed by degrees, owing to the action of the gelatine.

Notes.

The awards of the Vienna Exhibition have now been published, and we are glad to find the list headed by our esteemed correspondent, Dr. J. M. Eder, who, in conjunction with Captain Pizzighelli, received a silver-gilt medal for gelatino-chloride investigations, details of which have already appeared in our columns.

No gold medals were awarded. Among the happy recipients of silver medals we note the names of Mr. Whipple, B.Sc., Director of Kew Observatory; Messrs. Marsh Brothers, of Henley-on-Thames; the Platinotype Company; Mr. Walter Woodbury, for his simplified Woodburytype process; and Dr. H. W. Vogel, of Berlin, for his new collodion-gelatine emulsion.

MM. Dagron and Jules Girard, for their micro-photographs, received bronze awards. In all, seventeen silver and thirty-seven bronze medals, and twenty-six honourable mentions, were awarded, together with seven silver-gilt medals.

For the first time in a photographic exhibition, photographic publications were admitted, and three bronze medals and three honourable mentions apportioned to this particular section. The PHOTOGRAPHIC NEWS has been honoured by one of the medals.

A stir has been made among the learned societies to affix memorial plates on houses in London in which great men have lived and died. The habitations of Sir Isaac Newton, Faraday, Hogarth, Sir Joshua Reynolds, and others, have thus been noted. Would it not be well to have the houses photographed?

There could be no objection raised to making pictures of such dwellings, and their publication ought to be remunerative. Or, if objections be raised, it is speedily overcome. Mr. Brown, of the firm of Brown, Barnes, and Bell, when making memorial pictures in Liverpool some time ago, told us that an old lady living in Mr. Gladstone's natal place made a fuss about the house being photographed. She objected; still the image came out very brilliantly on development, and, when printed, yielded some uncommonly good pictures.

Mr. Cobb, who visited Cloudland last week with his camera, will write a paper on "Photography in a Thunderstorm," in our next issue.

A wonderful feat in photography, a gentleman announced, in breathless accents, he had just accomplished. With an electric shutter and rapid gelatine plate he had taken a pot-shot at the "Flying Scotchman" as it scudded away across the Hornsey Fields, leaving wreaths of white smoke in its train. But that was more than a month ago, and as no picture is forthcoming, we fear his performance was only half complete; like Jones, who said he had swum between Dover and Calais—but not all the way.

To-night, the electric light system of Mr. Swan is to be used for the first time in the House of Commons. The Swan lights will be burning under the galleries during the whole period of the sitting, and, if no mishap occurs, the experiment will go far to secure their adoption permanently in our legislative assembly.

Photography at a fancy fair. Last week Mlle. Sarah Bernhardt was announced to appear in Paris as a photographic artist at the fête organised in support of the sufferers by the Chio earthquake. At the last moment Madame Theo, another Paris favourite, took Mlle. Bernhardt's place, but, instead of operating, sat and stood in a variety of poses. Says the *Daily News*: "An admiring and amused crowd collected, and jests were made about Theography and Theophitist, at which the pretty actress laughed. A nobleman who is a Turf celebrity was the photographer. He was made up to appear like a wild unkempt Bohemian."

Why is bromide of silver in gelatine more sensitive than bromide of silver in collodion? Mr. Warnerke, on Tuesday evening, offered a very plausible explanation, which, by the way, is one that has been advanced by Captain Abney. The difference in sensitiveness is due, and due alone, to the mechanical condition of the two vehicles. If a gelatino-bromide film is subjected to pressure, its sensitiveness is decreased, Mr. Warnerke said, for he found that an ivory point used like a pencil, and pressed upon the film, was productive of a less sensitive material in such parts.

Similarly Mr. Warnerke found, by reducing the pressure or strain upon the bromide of silver particles—that is, by moistening the gelatine film, and thus swelling it—the sensitiveness was increased. So that, like Capt. Abney, Mr. Warnerke is of opinion that it is not a chemical, but a purely mechanical, reason why particles of bromide are more sensitive in gelatine than collodion. But how is the insensitiveness of silver bromide in a spongy film of wet collodion to be explained, we wonder?

We all know that the ordinary looking-glass, when used as a mirror, furnishes a double image. Mr. Galton told the Photographic Society on Tuesday that this defect is scarcely noticeable—he did not know why—in an old looking-glass, whereas such glass newly manufactured gave a most marked double reflection. Photographers should note this fact.

The opening of the Dundee Photographic Exhibition is fixed for the 10th February, 1882.

Mr. Woodbury tells us that his new process Stannotype, alluded to last week, differs from the simplified Woodbury process with which our readers are acquainted. It is, we understand, a process in which the printing surface is gelatine covered with metal, or, so to speak, "acierized."

Touching our article on Publication, it may be mentioned that already two thousand copies have been printed of "In Maiden Meditation Fancy Free," the charming picture of Mr. H. P. Robinson, which secured a medal at the last exhibition in Pall Mall.

Topics of the Day.

LANDSCAPE STUDIES.

BY H. P. ROBINSON.

No. 3.—Subjects.

The variety of subjects open to the landscape photographer is infinite. If he does not find them at his own door, he can find them by aid of the railway in an hour. The country photographer, who knows how to look for them, has seldom far to go for scenes that will supply profitable work for his camera, while his London brother is much better off for landscape themes than he seems inclined to admit. Kent, Surrey, Sussex, Burnham Beeches, and Epping Forest are full of easily-reached beauties, and the Thames itself affords endless variety of splendid scenes, enough, indeed, to last a conscientious photographer his lifetime. The Upper Thames is so full of beauty, that it is now as favourite a resort for artists as Bettws-y-Coed used to be in the days of David Cox. The Lower Thames, with its constantly-changing shipping scenes, is full of picturesque life and animation, and that part of the river which runs through London presents some of the most superbly-composed pictures that could be found anywhere. It is almost impossible to choose a standing-point on the Embankment, or any of the bridges, from which some picturesque and photographically possible view is not to be seen. The Houses of Parliament, Somerset House, and St. Paul's always compose well, and the atmosphere, almost always grumbled at by the London photographer, appears to me to lend a great charm to the effect. These subjects have never, as far as I know, been worthily treated. Stereoscopic studies and small pictures have been done; but they have never been used for photographs of any important size. The hay barges, groups of which are nearly always to be seen below London Bridge, would be well worthy of the serious attention of the photographer who wants to exhibit photographs with striking effects. It is not so much that good subjects do not exist everywhere, as that photographers have not trained their eyes and minds to see them.

It is a very curious thing, this art of seeing. In "Pictorial Effect," I gave a chapter on the "Faculty of Artistic Sight;" it will not, therefore, be necessary to go into the subject at any length here. It has been well said that few people see more than five per cent. of what is before them. Some people are contented with little; but others find that the more they learn, the more they enjoy. As an illustration, I may quote my own experience in a department of science not connected with photography. Some years ago an entomological friend was visiting me, and innoculated me with the collecting mania. We confined our studies to a section of the British moths, and I was astonished at the world of beauty that was opened to me. I have always been a lover and observer of nature; but, until I made a collection, I had no idea of the number, variety, and surprising beauty of the British moths; in fact, I had never been able before to *see* moths, except the few that committed suicide at night in the gas. The moths are now a source of constant delight to me by day and by night. The same results will follow, no matter in which direction we turn in our search for objects of study, so that we go to nature and learn to *see*; and the photographer will find that the more knowledge he obtains of what constitutes a picture, the more materials for pictures he will discover. It is true we cannot always do as we like with our materials; we cannot always compose our pictures as we could wish. In photography, as a wise man once said, "circumstances govern actions, and play the fool with our intentions," thus making it one of the most difficult of the pictorial arts; but arrangement and composition is a good deal in the hands of the artist who knows how to use these aids to pictorial art.

There is a good deal of monotony in the subjects chosen by photographers. Nobody seems to have the inclination, or, perhaps, the power, to break out in a fresh place. It is, perhaps, found to be easier to follow the lead of others than to invent for ourselves. Many subjects are not attempted for fear they should not come out well. They look beautiful in nature, but they do not accord with photographic traditions—they are not like the usual thing. But the photographer should "greatly venture."

> "He either fears his fate too much,
> Or his deserts are small,
> Who dares not put it to the touch
> To gain or lose it all."

Don't be afraid of being original. A few mechanical defects are easily overlooked, if not applauded. Visitors to exhibitions are as tired of the technical perfections of photography as the Athenians were of hearing Aristides called the just. Last year I wilfully put a considerable portion of a picture out of focus, which could as easily have been taken with perfect definition, and it turned out to be one of the most popular I ever did. But I hope this little personal anecdote will not lead my young readers astray; it was not the mere fact of part of it being out of focus that made this picture a favourite with the public; the subject was sufficiently interesting to overpower the technical defect. Sir Walter Scott, in writing to his publisher about one of his poems, said, "As for what is popular, and what people like, and so forth, it is all a joke. *Be interesting*, and the only difference will be that people will like it so much better for the novelty of their feelings towards it. Dulness and tameness are the only irreparable faults."

Some photographers estimate the value of their subjects by the amount of difficulty they experience in obtaining them. I once knew a man who cared nothing for the most perfect effects that nature could afford, if they gave him no trouble to reach, and he always went into raptures over an ugly view obtained from an almost inaccessible place, at some risk of his life.

In the last chapter I mentioned several artists who had made successful pictures containing figures, without sacrificing the landscape; there are one or two other painters whose works may be taken as models by the photographer with the greatest confidence. One of the secrets of the pleasure conveyed by the works of David Cox consists in the way in which he always introduced his incidents and figures, so naturally, and so appropriate to the place. There can be no doubt that the introduction of some incident in a landscape adds vastly to its interest. Let the picture tell a story, however slight, and technical defects are forgotten. The scenes of rural life by Birket Foster, especially his drawings on wood as illustrations to books, afford grand lessons in the introduction and composition of groups of figures, and incidents, and light and shade. The student will find in these illustrations the great use made of one artistic expedient which I have often mentioned, and which is always successful.

The extreme limits of light and dark are brought together in small quantities, and the rest of the picture is in demi-tints and half-tones. If two horses are drawing a cart, the one will be black and the other white, and they will be found to be on the one spot in the picture that was necessary to be so occupied to pull the whole together. If cattle are represented in a pool, a white cow will be found opposed to a black, while none of the others will be found to be quite black or quite white.

In conclusion, what photographers want in their subject and their treatment of them, is more originality, more daring, more pluck. We have run in the old grooves long enough, and it is time we took to another line of rails, or retire into a siding.

The "Topic" for next week will be "Balloon-Photography in a Thunderstorm," by W. Cobb.

Correspondence.

BLACK PAPER FOR GELATINE POSITIVE PICTURES.

Dear Sir.—I have been trying some of Messrs. Morgan's new Argentic paper, and the great facilities it affords in certain directions have suggested the idea that Messrs. Morgan's new process would be most useful if further extended. I would suggest that ferrotype plates, or a substratum of black paper (glazed or plain), should be used for the production of rapid positive pictures. The trade in ferrotypes has been a very lucrative one, and still is so, and surely the process of Messrs. Morgan applied in that direction would be very valuable and very lucrative also.

Ferrotype plates should be a good substitute for glass, and if black paper were substituted for white, we might produce the most rapid pictures, handed over, in passepartouts or other suitable frames, to the sitter in a quarter of an hour or less. It would be better if pyrogallic acid could be used as well as oxalate for these pictures.

I have not yet tried the new paper of the Photographic Co-operative Society, of 43, Charterhouse Square, which allows the use of pyrogallic, but have sent for some, and will report in your columns the comparative advantages of this and the paper of Messrs. Morgan as used with oxalate.

It appears to me that any artistic pictures should be produced on this black paper, and what was done, and is being now clearly done, at the Polytechnic Institution on *white* argentic paper could be produced equally well on *black* paper, and either a negative or a transparency used at will, which would astonish the "many-headed," as Dickens termed that sapient multitude, the public, who were described by Carlyle in his summary of the population of Great Britain and Ireland, as "about forty millions, mostly fools."

As photographers are now being recognised to some extent as "artists," and as we shall have before long our room in the Royal Academy, I would mention an incident showing a painter's knowledge of photographic processes (and as a stimulus to Messrs. Morgan and *black* argentic paper). A few weeks since I was at an evening party given by a well-known artist here, and also a well-known exhibitor in the etching department of the Royal Academy. This gentleman handed to me some portraits in cases, saying, "See here; these were done thirty years ago; they are Daguerreotypes; you can't beat those now by any of your processes." I examined them, and found them very beautiful positives on glass—produced at Cheltenham—delicate and pearly, clear in the shadows, the high lights nearly approaching to white; no signs of fading—in short, as beautiful pictures as on the day they were produced.

Let Messrs. Morgan and Warnerke and the gelatine paper makers now provide us with rapid sensitized paper that will give quick and beautiful positives, and a further stride in the direction of the title of "Artists," and the photographic room in the Royal Acadcmy, will have been made.—Yours truly, Francis W. Turton.

Florence, June 4th.

OUGHT TWO BATCHES OF EMULSION TO BE MIXED?

Sir,—In a paper called "Gelatine Jottings" in the News of June 3rd, Mr. Coventry says that to obtain a batch of emulsion showing under given conditions No. 20 with Warnerke's sensitometer, he mixes a less sensitive emulsion with one which is much more so. For instance, if he had an emulsion showing only No. 10, he would specially prepare one which would show (say) No. 30. On mixing these in equal proportions, he obtains one which shows No. 20 as desired.

This is no doubt the natural thing to do; but is it quite scientific? If you have a solution containing 10 grains of silver per ounce, and mix it with an equal quantity of a solution of 30 grains per ounce, you get one of 20 grains, and it will be the same as if you had originally made a solution of that strength, because the nitrate of silver and the water are exactly the same in both solutions; but this is not the case with the emulsions. On the contrary, the gelatine or the silver bromide, or both, are in different conditions, and it is this difference which makes one emulsion more sensitive than the other.

Suppose that under given conditions of light, &c., emulsion A requires only ten seconds' exposure, while B needs twenty to make an equally good negative, and that two plates are coated with them and exposed together for fifteen seconds, it is evident that neither emulsion will be made the best of. By separate development and by modifying the developer to suit each plate, a fairly good negative might probably be obtained in each case.

But if the photographer is compelled to develop both plates in the same dish, and moreover for the same length of time, it is evident that A will be completely fogged and spoiled before justice has been done to B; and this, I presume, is precisely what will happen when two samples of emulsion are mixed, of which one is twice as sensitive as the other; the particles of A will be quite fogged in the shadows before those of B have done their duty in the high lights. If this is not the case, it would be interesting to know why not. I conclude from these considerations that it is a mistake to mix two batches of emulsion of unequal sensitiveness.—I remain, sir, yours faithfully,

Joseph Paget.

REDUCING OVER-PRINTED PROOFS.

Dear Sir,—With reference to the discussion as to the priority in use of cyanide for reducing prints, the enclosed cutting from the Photographic News, February 24, 1871, may perhaps be of interest. I have just accidentally come across it.—Faithfully yours, W. J. Wilson.

"Dear Sir,—Having over-printed some photographs, I toned and fixed them; I then put them into a weak solution of cyanide of potassium. Much to my delight, they became gradually light, and did not change colour as they will do when left long in hypo soda. I should like to know if any of your readers have tried the like experiment.—I remain, dear sir, yours truly, G. A. Nicholson.

"1, *Green Street, Grosvenor Square, W.*

"[If the cyanide solution be used very dilute, it will answer well. The danger is, that if in any degree too strong, the prints rapidly reduce too much, and in an irregular, granulated fashion.—Ed.]"

Dear Sir,—I quite agree with Mr. England that there is no novelty in the use of cyanide for reducing over-printed proofs, but until I worked out the system as I did, I had found nothing published that was reliable. Mr. England will find the article mentioned published in the *British Journal*, No. 1027, vol. xxvii., page 21, January 9th, 1880.

I see Mr. G. Lewis proposes to use chloride of gold in conjunction with cyanide, but what he introduces the gold for I cannot conceive, as the prints in question have been already toned, and if they had not, gold will not tone in the presence of cyanide—at least, that is my experience with it. The same again in toning transparencies that have been fixed with cyanide, for until the last traces of the cyanide have been washed out, toning is impossible. I well remember trying the use of cyanide for reducing over-printed proofs in 1864, or even earlier than that, but did not succeed. *Has* Mr. Lewis tried the addition of gold as he recommends, and, if so, what effect had it in his hands?

In your last issue, I also see that Mr. H. H. Harding says he has used cyanide for the same purpose, but he does not say how much water he used. I should like to know his object in using common salt, and the ammonia? I myself think it best to keep all alkaline substances out.—I remain, sir, yours truly, W. Brooks.

Sir,—Doubtless the further information given to Mr. England and other readers of your valuable journal by Mr. Harding on the above subject would be very useful had he not, like many other contributors to the News and Year-Book, been somewhat indefinite in his formula, having omitted to tell us how much saturated solution of common salt he used with the given quantity of cyanide and ammonia. In looking through the Year-Books, I have now and again noticed that what would doubtless be good formulas, are rendered practically useless by the omission of the proportion of one of the ingredients.

I have tried Mr. England's weak solution, and find it answer.—Yours truly, W. Coles.

GELATINO-BROMIDE AT A DISCOUNT.

Dear Sir,—May I reply to your correspondent who calls himself "Thick Head." Please to notice, he says his negatives "develop beautifully." I have been in the same difficulty, but, understanding the cause, am no more troubled, and thick gelatine will give as clean and bright negatives as collodion. My interest in photography is almost confined to field work, and with collodion I have been in the practice of leaving either the removal of the silver salts, or the washing, till the end of the day. With gelatine I have failed till quite lately in making it as convenient as collodion.

With commercial plates I had less difficulty than with my own make, and my films were still more liable to decolouration after development. This led me to the true cause of the difficulty, viz., the extra thickness of the film. If, as in most commercial plates, the amount of bromide of silver is such that the picture will develop well at the back, there is little difficulty or liability to decolouration; but if the film is made thicker with the view to produce the best results without regard to cost, the liability to decolouration after removal from the hyposulphite is much increased. In my films, to which reference has been made in your columns, I have more than double the quantity of gelatine to deal with than is on an ordinary gelatine plate, and the tendency to discolouration is proportionally increased. But there is a perfect remedy, and one that will, I think, help your correspondent referred to, viz., to reduce the strength of hyposulphite solution, and passing direct from the hyposulphite to a saturated solution of alum. I have found the plan to give clean and brilliant results, even with prolonged development.—Yours respectfully, A. Pumphrey.

Sir,—In reply to "Thick Head," I may state that I have met with the same defect, and find it comes especially from the employment of a faulty ammonia solution, and is exaggerated by the Eder alkaline method. This fault only occurs on employment of the pyrogallic developer. I never saw the same plates exhibiting it by oxalate developer. It may sometimes be overcome by employment of more bromide in the emulsion. First test your ammonia for purity; then add a small quantity of distilled water, and neutralize with dilute pure sulphuric acid. Should the liquid have any smell, the ammonia is of no use.—I am yours truly, O. Pfinninger.

[If the ammonia is entirely neutralised by sulphuric acid, as our correspondent suggests, it is rendered valueless.—Ed.]

LENS OR NO LENS?

Dear Sir,—In reply to Captain Abney's criticisms on the remarks which I ventured to offer under this head, will you kindly allow me to state—

1st. That, passing over the discrepancy as regards the duration of exposure, Captain Abney's and my own results agree in respect to the image being "ill-defined, somewhat like what is seen in a negative where the camera has shaken." Hence no practical result *without a lens*, or with what is called the "natural camera."

2nd. I note the Captain's suggestion that tinfoil pierced by a fine needle would have given a better aperture than the perforated mahogany partition employed by me, which, instead of being ·11 inch in thickness, as predicted, was actually ·23 inch thick, as measured by the micrometer and Stanhope lens which he so much despises, or nearly a quarter of an inch when measured roughly with an ordinary rule. I admit the possibility of the bevil not being sufficiently clear to give the best effect, but no extraneous light could have passed through the blackened and varnished wood.

3rd. I agree that long-focussed, uncorrected lenses may be employed on an emergency, having used one myself in March, 1858, when photographing the eclipse of the sun; but the necessity for stopping down, in order to get a well-defined image, puts the whole matter in the category of "makeshift," now-a-days very undesirable.—I remain, dear sir, yours truly, John Spiller.

MR. WARNERKE'S NEW PROCESS.

Dear Sir,—In the last issue but one of the News, a letter from our esteemed friend M. Vidal appears, in which he gives an account of his want of success when applying my process to the production of negatives exposed in the camera through the glass, and also complains of the insolubility of the entire film of gelatine by the action of pyrogallol, independently of the action of light; asking me for more details on the subject.

Respecting the first part—viz, taking the negative through the thickness of the glass—very few experiments have taught me that when the developed image is to be produced wholly, or even partially, by rendering the vehicle insoluble, no good result can be expected, if the developing or dissolving action be first applied from the wrong side, or the side of the sensitive film the least affected by light.

Numerous attempts which were made some time ago with the carbon process in order to expose through the glass and develop the image without transfer, were signalised by total failure, in consequence of irregular development. In the case of the emulsion applied in similar manner, to the cause of insuccess above mentioned, another of the very worst character is added, viz., blurring is infinitely worse than in the case of glass plate used in the ordinary way. And no wonder, because the whole light, before it reaches the sensitive surface, fully illuminates the glass, and this produces the effect of blurring, the intensity of which is so much greater than that produced when the plates are used in the normal way, as the difference between unobstructed light and one filtered through the semi-opaque film of gelatine emulsion.

But even when this system is not used, the image produced must not have any film of insoluble gelatine, beyond what is produced by the action of light and developer. The difficulty related by our friend is one I encountered too at the beginning of my experiments, but I overcame the difficulty; and now I propose to give an account of the trouble, and the way to overcome it.

In my first experiments I used my own emulsion, from which everything was eliminated that could posibly affect the solubility of the gelatine; as result, I had an image easily developed in only tepid water, the high lights represented by the bare glass. The freedom from any insoluble film is tested by using solution of permanganate of potash, under the action of which, if any gelatine is left undissolved, it will be evident by the stain usually produced through the formation of peroxide of manganese whenever permanganate comes in contact with gelatine. I must, however, warn experimentalists from the error easily committed by mistaking stains produced by the substratum used, for the gelatine stain. The substratum must therefore be first tried for the action of permanganate, or any soluble colour, which can be used for the same purpose. When the image is submitted to the treatment of warm water before it is fixed with hyposulphite of soda; also all the soluble gelatine is actually removed by the solution, the white bromide of silver in the shape of fine powder is still sticking to the surface—marring otherwise good results. This is occasioned only by the fineness of the particles of bromide of silver. A strong current of cold water, or gentle rub with cotton-wool, will clear the image if diluted solution of fixing agent is objected too.

Recently, however, I met a case similar to one mentioned by M. Vidal. The emulsion was different to one I have been in the habit of using. A series of fine negatives were developed by pyrogallol very successfully, fixed, and left for development till a future time; but, to my astonishment, they proved quite insoluble even in the boiling water. No alum was used in the emulsion. Apparently insolubility could be attributed only to the action of pyrogallol. However, after many experiments to resuscitate the lost solubility, I succeeded beyond my expectation, and can recommend the system in similar cases. It consists in the addition of acetic acid to the warm water. Development can be hastened by raising the temperature; but acetic acid, unless used in too large a quantity, answers well.

It may, perhaps, be useful to mention here that some gelatines are apt to produce emulsion almost insoluble without any addition except nitrate of silver and bromide; this may be due to the treatment of gelatine by the manufacturer. The users of this new system must take this into consideration when choice of gelatine for emulsion is made.

A fact not universally known is, that if gelatine treated with hydrochloric acid in very weak solution, and thoroughly washed with water, be used for the emulsion, the resulting films will be just as insoluble as if some alum were added to the emulsion; this quality, so useful to the production of glass plates, is rather objectionable in the new process.

Before I conclude these remarks, may I be permitted to say, that now exposing through the glass is attempted in order to avoid the undesirable process of double transfer, I succeeded recently in avoiding double transfer by very easy means. Emulsion spread on suitable paper is exposed in the camera, either in the roller slide, or a flat slide of very simple, inexpensive, and effective construction (not yet described). This, developed with pyrogallol, is put in contact with the glass plate, talc-ed, collodionised, and immersed in water when collodion is set. After ten to fifteen minutes is immersed in warm water, paper peeled off, and soluble gelatine removed and dried. Some sheet gelatine is procured, of the kind used by engravers for tracing. This is immersed in cold water with previously finished negative, and when the gelatine has become pliable, but not quite swollen, it is squeegeed to the negative; when this is dry, it will leave the glass, presenting a flat, rigid, glass-like sheet, bearing the negative, which can be printed from both sides. In order to protect it better before the sheet is detached from the glass, a coating of collodion is advisable. L. Warnerke.

[Unfortunately, this letter was crowded out last week. —Ed.]

WORK AND WAGES.

Sir,—In your excellent article on "Work and Wages," you did not mention a class of assistants, viz., those that operate and retouch their own negatives. Would you kindly inform me what you consider a proper wage for an operator and retoucher who has entire management of the studio under a manager who has nothing to do with the practical part of the business, and who takes about eighty sitters a week? Specimen of class of retouching and manipulation I enclose, both wet and dry plates. I may mention that the operator and retoucher has no assistant, only a boy to clean plates. This is at a branch establishment of a very large firm.—I am, faithfully yours, G. H. J.

[The prints enclosed represent fair work. Perhaps some of our correspondents can answer the question.—Ed. P. N.]

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE last meeting of the session was held on Tuesday, at 5A, Pall Mall East, J. GLAISHER, Esq., F.R.S., in the chair. Mr. W. J. Cox, of Derby, and Lieut. Gladstone, R.N., were elected members.

Mr. FRANCIS GALTON, F.R.S., then read a paper on "Composite Portraiture." Mr. Galton stated that his attention was first directed to the subject some years ago, when he found that by taking two or more portraits of different individuals under exactly the same conditions, and superimposing them, the features, if not absolutely dissimilar, blended together and formed an idealised portrait which could be well seen when the image was thrown upon a magic-lantern screen. The register he adopted, so that the features should be identically superimposed, was by drawing a horizontal line through the eyes, another parallel to this through the mouth, and a third perpendicular to and bisecting these horizontal lines through the nose. The point of bisection between the eyes was that which he was especially careful to maintain in the same position in each portrait. Mr. Galton's first method of producing composite portraits was by means of a copying camera, paper positives being used. He now, however, used transparencies, and he exhibited and described the apparatus which he had adopted for the purpose. One purpose for which he believed composite portraits would be valuable was that of producing a standard physiognomy of disease. With this object he had taken the portraits of a number of consumptive persons, male and female, and had combined them; and it was remarkable how a certain average of faces was found to be almost identical. Mr. Galton also exhibited a number of what he called typical portraits. One was the face of an idealised criminal formed from a combination of seven portraits of criminals, others were the faces of consumptive patients, and a third series was that of the portraits of officers and men of the Royal Engineers. In one case he had combined the portraits of twelve officers, in another the portraits of eleven privates, and in a third he had combined the portraits of officers and privates. In each instance Mr. Galton said the individuality marking each class was strongly brought out and idealised. He also pointed out how in every case the idealised portrait was better looking than the faces from which it was made. In conclusion, Mr. Galton referred to the use which photographers might make of composite portraits. He thought the process could be turned to a most interesting account in the production of family likenesses. Artistic excellence was of no consequence in the negatives, and all that was necessary was that the portraits should be taken under the same aspect, either a perfect profile or a perfect full face, and under the same conditions of light and shade. The result of the combination of a number of faces of the same family was often very curious, not the least singular point being the circumstance that there was often a difference of opinion as to whom the idealised portrait was most like.

Mr. WARNERKE said, that when Mr. Galton first described his method some years ago, he had tried the production of composite portraits, and found the result exceedingly interesting.

Captain ABNEY expressed surprise at the result of an experiment which Mr. Galton had made to show that repeated exposures on the same plate made no difference in the result. Had not Mr. Galton proved that he was right, he should have expected there would have been some difference.

After a remark from Colonel WORTLEY,

Mr. GALTON observed that one curious result he had noticed was in the case of a combination portrait of two criminal boys. This portrait was given to an artist to copy, and, singularly enough, although the artist had never seen either of the boys, the picture he drew was a portrait of one of them rather than a copy of the composite.

A vote of thanks, after some laudatory remarks from the President, was then passed to Mr. Galton.

A paper by Captain ABNEY was taken as read.

Mr. WARNERKE made a communication in regard to an improvement he had effected in his method of developing gelatine negatives with pyrogallic acid and hot water. It had been pointed out that the double transfer was a drawback, and he had now to say that he had got over this difficulty by stripping the negatives according to Wenderoth's method. These negatives he had succeeded in making perfectly waterproof, and they could be printed from either side without showing any perceptible difference. In regard to the insolubility of the gelatine after treatment with pyrogallic acid, some experimenters had found that it was probably due to a small quantity of acid introduced by the makers of the plates. This difficulty, however, could be overcome by the use of acetic acid, and by raising the temperature. Mr. Warnerke also stated that by accident he had discovered a confirmation of Captain Abney's statement that the superior sensitiveness of gelatine plates was due to molecular arrangement rather than to chemical change. He had found that pressure on the plate considerably diminished sensitiveness, while, on the other hand, wetting the film increased it.

Captain ABNEY confirmed Mr. Warnerke's statement as to the effect of pressure on the gelatine film. In the case of blue bromide, if pressure were used it became red, which was very much less sensitive. He thought that the molecular restraint exercised by gelatine was fatal to the most perfect sensitiveness of bromide of silver. As Mr. Warnerke had stated, when a portion of that restraint was taken off by wetting the film, the sensitiveness was increased.

After some remarks from Col. WORTLEY and Mr. BERKELEY, the subject dropped.

The PRESIDENT then presented the progress medal, which had been awarded to Mr. Willis for his plantinotype process, to Mr. Berkeley, as Mr. Willis's representative.

It was announced that the next technical meeting would be held on June 28th, Captain Abney presiding, and that the gentlemen who would act as judges in connection with the next exhibition would be Mr. G. D. Leslie, R.A., Mr. H. Herkomer, A.R.A., Mr. Jabez Hughes, Mr. Payne Jennings, Mr. W. D. Howard, and Mr. Seymour Conway.

The meeting then adjourned.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

AN exhibition of photographs, photographic apparatus, and appliances, open to Great Britain and Ireland, will be opened in the galleries of the Albert Institute, Albert Square, Dundee, on 10th February, continuing for four weeks. The following are the conditions :—

An entrance fee of five shillings to be paid by each exhibitor, for which 15 square feet of wall space will be allowed; extra space will be charged 6d. per square foot.

All pictures for exhibition must be sent mounted and framed, with the artist's name and address on the back; the titles of the subjects, and process by which produced, may be neatly affixed to the front of the pictures (outside of glass). On no consideration will the name or address of the artist be permitted on the front, as such will appear in the catalogue, and no pictures in Oxford frames will be admitted.

The Council undertake to unpack, re-pack, and return all exhibits remaining unsold; all carriage must be paid by the exhibitor. The very greatest care will be taken of the exhibits; but, at the same time, the Council will not hold themselves liable for any untoward accident that may occur, with the exception of loss by fire, which is specially provided for.

The Council will undertake the sale of the exhibited pictures, at a commission of 10 per cent., with the exception of those gaining medals, which will be at 15 per cent.

Photographs coloured by hand may be exhibited, but will be excluded from competition.

The Hanging Committee will reserve the power of rejecting any pictures.

Each exhibitor must fill up forms to be obtained from the Hon. Secretary, to whom they must be returned not later than December 26th.

All pictures intended for exhibition must be sent carriage paid, to arrive not later than January 26th, addressed "Photographic Exhibition, Albert Institute, Dundee."

The following is a list of the medals which will be awarded the best and second best pictures in the various classes, and to be decided on the opinions of the appointed judges :—

1. A Gold Medal for the series of (not fewer than six) Portraits which, in the opinion of the judges, possesses the highest degree of merit, irrespective of size.
2. A Gold Medal for the series of (not fewer than six) Landscapes which, in the opinion of the judges, possesses the highest degree of merit, irrespective of size.
3. One Silver and one Bronze Medal for the best and second best series of (not fewer than six) Landscapes of 8½ by 6½ or under.
4. One Silver and one Bronze Medal for the best and second best series of (not fewer than four) Landscapes above 8½ by 6½.

5. One Silver and one Bronze Medal for the best and second best series of (not fewer than six) Portraits of 8½ by 6½ or under,

6. One Silver and one Bronze Medal for the best and second best series of (not fewer than four) Portraits above 8½ by 6½.

7. A Silver Medal for the best Genre picture.

8. A Silver Medal for the best Enlargement of any subject, by any process, provided it be the work of the Exhibitor.

9. A Bronze Medal for the best Transparency or series of transparencies.

One Silver and four Bronze Medals, to be awarded according to the discretion of those acting as judges, for Improved Apparatus, Materials, Processes, or other meritorious productions.

11. A Bronze Medal for the best series of Pictures mounted on glass, irrespective of size or subject.

12. One Silver and one Bronze Medal for the best and second best series of (not fewer than four) Landscapes of 8½ by 6½ or under. Limited to Amateurs, actual Members of this Association, admitted previous to October, 1881.

Apart from photographs for competition, the Council will esteem it a favour if those who have any interesting examples of the progress of photography, will kindly lend them for exhibition.

All communications must be addressed to the Hon. Secretary, Charles Johnson, 43, Nethergate, Dundee, N.B.

WEST RIDING OF YORKSHIRE PHOTOGRAPHIC SOCIETY.

THE Society's first excursion of the season will be on Wednesday, the 22nd inst., to Bolton Abbey, by train leaving Bradford at 9.53 a.m. for Ilkley, thence by waggonette to Bolton Bridge.

Mr. S. C. Bridges has kindly offered to supply gratuitously all members of the Society (wishing to take photographs) with his instantaneous plates, sizes up to 12 by 10, who will communicate at once to Mr. R. Holgate the number and size required, so as to allow time to get them out.

The price of the tickets is 7s. each; which includes dinner, and fare by rail and waggonette to and from Bolton Bridge.

Talk in the Studio.

PORTRAITS OF H.R.H. PRINCESS OF WALES.—Summoned to Marlborough House on the 5th ult., Mr. Bassano was enabled to take in the conservatory some admirable portraits of H.R.H. the Princess of Wales, in her state dress, tiara, &c., as she had just come from the Drawing Room.—*Cuckoo.*

MR. WILLIAM ENGLAND.—We are glad to hear that Mr. England has just received a very handsome medal for services rendered as juror at the Paris International Exhibition of 1878. Nor is this the only souvenir that has come to the illustrious photographer in connection with the Paris gathering. The Prince of Wales presented Mr. England at the close of the meeting with a fine etching of His Royal Highness printed on vellum with autograph attached. We are pleased to find, therefore, that jurors are occasionally not forgotten.

ASCOT IN THE CAMERA.—Acceding to the request of thousands that I would try the effect of my Nitro-Galvanic Telescrophone instantaneous portrait-taker at Ascot, I took my stand on the race-course. The reader must know, then, that the Nitro-Galvanic Telescrophone (as, indeed, its name would denote) is a machine for producing historical scenes in their true colours—material and mental. By a simple contrivance I have avoided that air of repose which spoils so many sun-pictures, and substituted for it a kind of artistic vivacity which must be seen to be appreciated. The frame of my machine is constructed exclusively of ivory, steel, ebonite, pewter, walnut wood, glass, *papier maché*, iron, buffalo hide, and bamboo canes. With these simple materials I have made a kind of casket, which resembles something between a beer-barrel and a balloon. It has all the strength of the former, with many of the characteristics of the latter. It can be easily transferred from place to place, being extremely portable. All that it requires in ordinary circumstances is a few waggons and a couple of traction-engines. Of course common prudence would dictate the choice of a fine day for one of these journeys, as the mixture of gun-cotton and paraffin (used in the preparation of the sensitive plates) is apt to get a little out of order when exposed to untoward atmospheric influences. However, with proper care, the Nitro-Galvanic Telescrophone is as easily managed as anything else requiring a trifle more than ordinary attention—say a rogue elephant, a wounded tiger, or a damaged fish-torpedo. It is worked by electricity and portable hydraulic pumps. Arrived at Ascot, I selected the turf in front of the Judge's chair, as the scene for my instantaneous picture, as it occurred to me that the portrait of the winner of the chief race would be more interesting than any other memorial. I therefore rejected the causerie on the lawn, the Royal procession up the course, the group of drags at the luncheon-hour, in favour of the incident I have above specified. The salient features of Ascot are so well known that it is unnecessary to refer to them. Charming toilettes, lovely faces, well-appointed turn-outs were to be seen as much this year as on any of its predecessors. The crowd assembled; some of the smaller events were settled; lunch was commenced—and then came the race of the day. It was an anxious moment for me. I had arranged the apparatus with the assistance of the police to keep off the crowd, but my sensitive plates were rather behind-hand. Although prepared on very simple principles, they have to undergo several processes, and in their manufacture there had been several mishaps. For instance, one had been broken by a steam Nasmyth hammer, acting with rather too much force. Another had suffered from inferior bronze being used in one of the castings and a third had been ground to dust in the Marble Polishing Department. In spite of these and many other little accidents, I was able to secure one plate which was in tolerably good order. The supreme moment arrived. Built up on its portable iron and granite pedestal, the Nitro-Galvanic Telescrophrone was certainly a striking object. I stood just under the principal lens, with the chain in my hand, ready to pull the lever. All was ready. I saw a flag fall in the distance. On came the horses galloping at full speed. I could hear the cheers of the spectators. There was a shout. The winner was passing me! I pulled the chain! There was a loud explosion, a flash of light, and I and the Nitro-Galvanic Telescrophone went up into the air together. After some little trouble I have found the result, which I forward to you. It is not quite what I intended, but there are all the materials in it for a good picture.—*Punch.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best practical essay, "How I Retouch and Varnish My Gelatine Negatives." Contributions must be sent in not later than 1st July. For rules, see previous Nos. of the NEWS.

⁂ EMBARRAS DE RICHESSES.—Forty-five articles have reached us on the subject of preserving and registering negatives, and from these we selected twenty, all of which might be published with advantage. It has been a long and difficult task to make a second selection, and, after all our work, there remain four essays on our hands, coming respectively from Newcastle, Barnstaple, Gloucester, and Arundel. Under these circumstances we shall double our prize to four guineas, and beg our contributors to accept a guinea each.

⁂ Pressure on our space compels the postponement of "At Home."

TYRO.—1. If sufficient is added, all animalculæ will be killed; but it will have no effect on any organic impurities. 2. It is due to the absence of carbonic acid in solution, and may be removed by passing in a stream of the gas.

H.—Send the plates back to the maker.

E. H. M.—1. We have not yet heard of its introduction into commerce, and cannot say what is likely to be done. 2. The paper should be rather thickly coated; and the emulsion used, ought to be free from alum or any other body tending to produce insolubility.

AMATEUR.—1. In most cases the greater part of the work is done on the negative. 2. Much depends on yourself, but probably it would be sufficient.

A. HENDRY.—Write to Mr. W. Brooks, Laurel Villa, Reigate.

J. G. TAYLOR.—The patent taken out with respect to the first has expired. The second is a collotypic process which presents questionable points of novelty, and we believe that a patent exists. Collotypic printing generally is open to all, but the platinotype is subject to patent rights. Which process of photo-engraving do you allude to? That of Waterhouse appears the most promising of modern methods, and is not patented.

FRED DUNSTERVILLE.—Next week.

F. J. H.—We will make enquires for you.

"WILSON'S PHOTOGRAPHICS" received.

Several Answers crowded out.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1190.—June 24, 1881.

COMMISSIONERS OF PATENTS

CONTENTS.

PAGE
Carbon Transparencies for Enlargement ... 289
Composite Portraits ... 289
Photography In and Out of the Studio ... 290
At Home—At the School of Gunnery, Shoeburyness ... 291
The Way to Preserve Negatives and Register Them ... 292
Notes ... 294
Topics—A Balloon Trip in a Thunderstorm. By W. Cobb ... 295
A Day with the "Scots Greys." By Geo. Bradforde ... 296
Correspondence ... 297
Proceedings of Societies ... 298
Talk in the Studio ... 300
To Correspondents ... 300

CARBON TRANSPARENCIES FOR ENLARGEMENT.

The advantages of the carbon transparencies for the purposes of enlargement are too well-known to require recounting here. It may be noted, however, that carbon transparencies possess the full range of light and shadow of the negatives from which they are printed. The fine state of division in which carbon exists in transparency tissue renders it possible to produce positives which bear the strain of great enlargement. At the same time, a positive of this sort affords the best guarantee of detail and sharpness in the enlarged negative.

Professional photographers whose hands are fully occupied with the ordinary routine of work will naturally employ the best transparency tissue they can find in the market, nor will they have reason to complain if they fulfil the conditions by which the best results can be obtained.

Before setting to work to print a carbon transparency, a little forethought should be exercised in dealing with the materials required in the process. The operations are delicate, and require cleanly and careful manipulation.

Opaque points frequently arise through the tissue having been dried in a dusty place, anything which adheres to the face of the tissue being afterwards locked up between the gelatine and the support on which the tissue may be mounted; and it occasionally happens that a particle of dust may exert a chemical or reducing action on the film, thus causing the production of a little lump or clot of insoluble gelatine. Any solid particles which may float in the water used for mounting are also liable to be locked up in a similar manner; and defects arising from this cause are often laid at the door of the tissue manufacturer.

If the negative is thin and lacking in contrast, the tissue should be sensitized with a weak solution of bichromate of potash; on the other hand, a negative strong in contrast will yield a softer print by sensitizing with a strong solution of bichromate. It must be borne in mind, however, that the sensitiveness of the tissue increases in a ratio corresponding with the strength of the sensitizer.

It simplifies matters if the negatives to be enlarged are as nearly as possible of uniform density. The bichromate bath may then be employed of a standard strength.

In cold weather the proportion is:—

Bichromate of potash...	1 part
Water	25 parts

During hot weather the proportion of bichromate should be somewhat diminished. It is of importance that the bath, when in use, should never exceed 65° F., in order to avoid partial solution of the gelatine and a host of other evils. When it is desired to obtain an absolutely sharp structureless transparency, the following method should be followed. After sensitizing, the wet tissue should be squeegeed down to a temporary glass support. The glass having been first carefully cleaned and dusted over with powdered talc, the excess of talc should be rubbed off with a pad of flannel, and the glass finally dusted with a camel-hair brush.

Dr. Monckhoven recommends that the glass should be coated with plain structureless collodion. This may, or may not, be done. The sensitized tissue may now be laid, film side down, on the glass, and squeegeed until perfect contact is secured, care being taken to exclude air-bells. The tissue is allowed to dry on the glass. When dry it may be detached at any time within a week, and is ready for printing.

The duration of exposure is a matter which should be determined by experiment. It may be set down as one and a-half times, at least, greater than the time required for a carbon print on paper.

Nothing should be left void of covering, save the extreme high-lights of the picture. At the same time, blank opacity in the shadows should be avoided. In short, the transparency should show by transmitted light all that is in the negative, clearly and well defined.

The exposed tissue may now be moistened in cold water and squeegeed down to its permanent glass support, allowing it to rest for ten minutes, after which it may be immersed in tepid water (about 80° Fahr. to begin with), and development proceeded with until the unaltered material has been dissolved entirely out. The finished transparency may now be reared up to dry in a cold place.

The print, when too weak, may be intensified by employing the ordinary pyrogallic acid and silver used in the wet collodion process.

It is often a great convenience to strip carbon transparencies from the glass and to preserve them in a pellicular form; one of the most convenient methods of doing this being the mode of working suggested by Wenderoth. When intended for stripping, the transparency should be developed on collodionized glass, the plate having been talced or waxed before the application of the collodion. The development being completed, a piece of rather thick sheet gelatine is soaked in cold water until quite flaccid, after which it is laid on the wet transparency, and contact is established by means of a squegee. The edges of the gelatine are now clamped down to the glass by means of slips of wood and American clips. The whole should now be put in a moderately warm place, and, when the gelatine is dry, the pellicular transparency can be stripped from the plate with the greatest ease.

◆

COMPOSITE PORTRAITS.

During the past three years, Mr. Galton has made good progress in his method of so blending several portraits as to obtain an average of expression; and his paper, recently read before the Photographic Society of Great Britain[*] was listened to with unusual interest.

Mr Galton's older form of apparatus for securing composite portraits is illustrated by the accompanying cut.

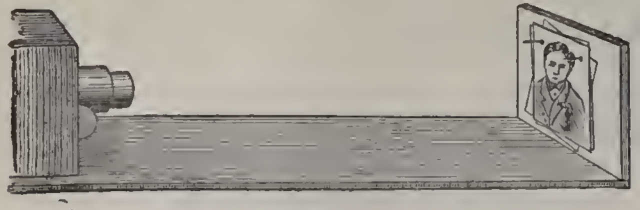


Fig. 1.

A series of paper prints are so threaded on pins that the point at which the two lines shown in fig. 2 intersect, shall exactly coincide in the case of every print. The horizontal line cuts the pupil of each eye, while the vertical line is drawn mid-way between the pupils, and the time of exposure is divided into as many equal fractions as there are portraits to be averaged, all these fractional exposures being made on the same sensitive plate.

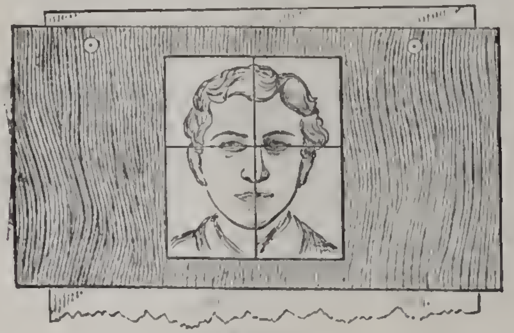


Fig. 2.

Mr. Galton now adopts a third register line, for securing proper super-position of the portraits, this being drawn horizontally through the mouth, and all pictures are so enlarged or reduced as to make both intersection points coincide. Instead of working with paper prints, the original negatives are now used, each one being separately placed in a holder, which is attached to an arrangement which resembles the mechanical stage of a microscope, this stage being fixed at right angles to the base-board of the copying-camera (A, fig. 3). A gas lamp, B, behind the negative, serves as a source of light; and a condenser is used, together with a diffusing plate made of ground glass. The focussing screen, C, of the camera is situated at the top, a mirror, D, being so arranged that it may either serve to deflect the rays towards the focussing-screen, or, when it is turned upwards on its hinge, as shown by the dotted line H, allow them to fall directly on the sensitive plate. It is obvious that if the register line were drawn or engraved on the focussing-screen, it would be merely necessary, in the case of each component picture, to so arrange the camera and mechanical stage as to secure coincidence of the register points, and to give each picture its proper fraction of the total exposure. It was found, however, in actual practice to be much better to make use of apparent bright lines on the ground glass screen, rather than actual dark lines, and this end is attained by viewing an illuminated transparency so that the eye refers the image to the screen; the well-known camera-lucida ordinarily used with the microscope being used.

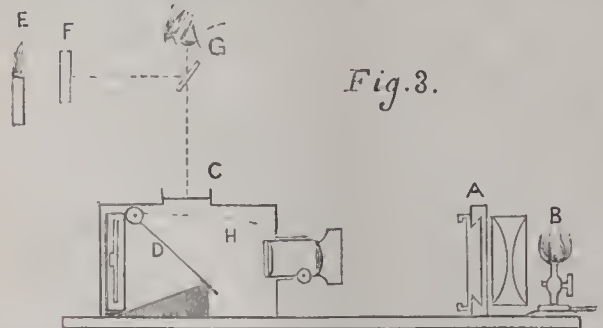


Fig. 3.

Let E be a candle so placed as to illuminate a negative of the registering lines placed at F. A piece of polished glass having its sides parallel, G, serves to reflect a portion of the rays from the negative, F, into the observer's eye, while the greater portion of the rays from the focussing screen, C, pass through the same glass without being deflected. Under these circumstances the bright lines of the negative, F, appear to the observer as if they were the focussing screen. A cap covers C during exposure.

The general direction of the camera-lucida arrangement is at right angles to the longitudinal axis of the copying apparatus, it being represented differently in the drawing, in order to make its principle clearer; and when in use the whole apparatus is tilted over a little on one side for convenience in working.

Among the pictures shown, we may mention a series of seven criminals and a composite taken from them; and in this case it was almost as if we looked on the ideal of a vicious face, although it was soft, smooth, and free from the individual markings of vice which often appear to arise rather artificially than to exist naturally. The composite seemed to represent a vicious man who had not actually fallen, rather than a hardened criminal.

To the physiognomist, the ethnologist, the physician, and the teacher of morality, composite portraiture will open up new fields of study; and our readers will doubtless derive much pleasure and profit from the study of Mr. Galton's paper, which we shall publish shortly. An account of the author's earlier studies on composite portraiture will be found in our vol. for 1878, pp. 254 and 266.

* * *

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Accuracy of Astral-Photography—Composite Portraits—Ants and Photography.

The Accuracy of Astral-Photography.—The last meeting of the Royal Astronomical Society was one of more than ordinary interest from a photographic point of view. Some few months ago, a discussion took place as to whether astronomical phenomena could be more accurately reproduced by photography than by hand-drawing. The subject which drew forth the discussion was the exhibition of Dr. Henry Draper's photograph of the nebulæ in Orion, the first instance on record in which any photographic trace of the light of a nebula had been obtained. As the photographs differed slightly from the drawings which had been made previously by hand, it was advanced by the supporter of the latter that the former were possibly incorrect. The majority of opinion, however, inclined the other way, and the superiority in accuracy of the photographs admitted. This opinion—not, indeed, as regards the photographs of nebulæ, but as regards photographs of the moon—was confirmed at the last meeting, when a paper by Professor Pritchard on "The Moon's Photographic Diameter, and the Applicability of Celestial Photography to Accurate Measurement," was read by Mr. Glaisher wherein Professor Pritchard was of opinion, from a comparison of measures of various photographs of the moon, that measures made upon such photographs might be relied upon as compared with direct telescopic measurements. It is satisfactory to find, from the discussion which followed, that the member who had, in criticising a former paper by Professor Pritchard, called attention to the want of data in respect to the photographic measurement, admitted that his objections had by the second paper been removed. At the same meeting, Dr. Weiss, of Vienna, who was on his way to Dublin to take possession of the magnificent 30-inch refractor which has been made by

---

[*] And briefly reported in our last number.

Mr. Grubb for the Austrian Government, exhibited some photographs of the plans of the new Observatory near Vienna. The building is in the form of a cross, and the large telescope will occupy a dome at the centre. In another dome is placed a comet-seeker, mounted so that the eye of the observer is always in one position; and in a third dome is a photographic instrument. Photography is evidently occupying year by year a more important position with regard to astronomy.

Composite Portraits.—Mr. Galton's suggestion as to how his "composite portraits" might be made use of by professional photographers, is capable of considerable development. The most important use to which they might be put has evidently not occurred to the inventor, who, doubtless, regards the subject only by the clear but unsentimental light of science. We have an idea that an enterprising photographer might make use of the process with very great advantage, and absolutely offer to make his sitters beautiful for ever without the clumsy aid of retouching, and without destroying the likeness. Our notion is that if every photographer had a good stock of types of beauty (male and female) he could, with a little study, be able to engraft a portion of this beauty on the unlovely faces of those of his sitters who might require improvement. A turn-up nose could thus have a dash of the Roman thrown into it, prominent eyes could be placed a little more in shadow, an ugly chin might be delicately rounded off—in fact, the improvements are practically numberless. We should scarcely advise the ardent photographer to allow sitters themselves to select the type, as their decisions might prove embarrassing, and the results disappointing—indeed, it would be well not to allow them to know "how it's done." It is human nature to like to believe that whatever beauty you may possess is all your own, and the sense of "adulteration" might be a drawback to the general acceptation of this method of beautifying. Besides, as Mr. Galton remarked, people are not to be depended on, as in the case of the artist who in copying a composite unconsciously drew the face of one of the persons who formed the composite. It would be disagreeable to think, when sending your photograph to some one who has never seen you, that he or she might admire the "other one," and not see you at all in the picture.

Ants and Photography.—Sir John Lubbock's researches on ants are very singular, and go to show that these industrious little creatures have very strong photographic taste, and are especially sensitive to the violet rays in the spectrum. They even have an advantage over human beings, for they can even see the ultra violet rays which are invisible to us. To prove the fact, Sir John utilised the dread which ants when in their nests have of light. If a nest is uncovered they think they are being attacked, and hasten to carry their young away to a darker and, as they suppose, a safer place. He satisfied himself by hundreds of experiments, that if he exposed to light most of a nest, but left any part of it covered over, the young would certainly be conveyed to the dark portion. Sir John further settled the point that ants were especially sensitive to violet light, and, when offered the choice, preferred running under pale yellow glass to that coloured a deep violet. He took a flat-sided bottle containing sulphate of quinine, which, as is well known, stops the transmission of the ultra-violet rays, and placed it over part of a nest, and over another part he put a piece of dark violet glass; in every case the larvæ were carried under the transparent fluid, and not under the violet glass. Again, he threw a spectrum into a similar nest, and found that if the ants had to choose between placing their young in the ultra-violet rays, or in the red, they preferred the latter. He infers, therefore, that the ants perceive the ultra-violet rays, which to our eyes are quite invisible. Now, as every ray of homogeneous light which we can perceive at all appears to us, a distinct colour, it seems probable that these ultra-violet rays must make themselves apparent to the ants as a distinct and separate colour (of which we can form no idea), but as unlike the rest as red is from yellow, or green from violet. The question also arises whether white light to these insects would differ from our white light in containing this additional colour. At any rate, as few of the colours in nature are pure colours, but almost all arise from the combination of rays of different wave length, and as in such cases the visible resultant would be composed not only of the rays which we see, but of these and the ultra violet, it would appear that the colours of objects, and the general aspect of nature, must present to them a very different appearance from what they do to us. Similar experiments which Sir John also made with some of the lower crustacea point to the same conclusions; but the account of these experiments he reserved to a future occasion.

At Home.

AT THE SCHOOL OF GUNNERY, SHOEBURYNESS.

A three-mile walk by the beach from Southend brings you to Shoeburyness, and a pleasant stroll it is on a fine day. The pathway follows the seashore, rising now and then high above the glittering waves, and in clear weather you can see right across to Sheerness; there are the forts lit up in the sun and the flagship of the Nore, the *Duncan*, a fine three-decker, lying at the mouth of the Medway. That tiny black line with a steamer beside it is Queenborough—where the Flushing packets start from—and the sharp point that stands up out of the water is Grain Fort. You cannot see much of Shoeburyness, for it lies hidden among the green trees yonder, and as the grey tongue of land in front is our destination, we leave the village to our left. But we get a glimpse through the clumps of green of pleasant red-brick villas and gaily-decked gardens that serve for officers' quarters, of a church, of the mess-rooms, and the trim barrack square.

We cross a meadow, and enter the Government ground. A stone with a broad-arrow upon it marks the War Department property, and stern notices that breathe of gunpowder and shrapnel are visible on every hand. Huge lumps of earth come into view, and all sorts of strange structures of wood, stone, and iron. Before we are well aware of it, we have trespassed into the middle of the practice ground, among guns and targets; huge black muzzles frown upon us from every quarter, and right and left are the monuments of their anger, big iron targets shattered and broken, and bearing shocking signs of ill-treatment. Stout timber, faced with iron plates, constitute most of the targets; sometimes the shot-marks are clearly-punched holes, sometimes they are represented by a mighty smash; the orifice is a jagged mass of fibrous iron, and every rivet in the plate has started. While we are examining these injuries, there suddenly comes a terrible "boom." It is not a crack, sharp and short, like the discharge of a field piece, but a thunder-clap that disturbs your stomach more than your ears, and make every muscle vibrate. They are at big gun practice, in front of us, and we had better be off out of the way.

Close to the shore, there are more guns, located in neat solid embrasures and batteries, where they could be employed as a means of defending the coast, and near at hand a row of white-washed cottages; hither we are directed when we ask for the photographic department. It is the last cottage in the row, and the doorway has painted on it "Photographic Rooms." It is upwards of a score of years since photography established itself at the School of Gunnery, and, under the Assistant-Superintendent of Experiments, was resorted to as an accurate and impartial method of recording results. To Capt. Alderson, R.A.—now Colonel Alderson, Assistant-Director of Artillery—belongs the credit of having first conceived the idea of utilising the camera in connection with gunnery experiments, and for some time that officer himself carried out all the photographic work. As the usefulness of the camera became more and more apparent, it was necessary to secure further aid, and a Staff-Serjeant Photographer was appoined, together with a gunner to act as deputy. Further assistance when necessary is always to be secured from men in the Royal Artillery stationed at the School of Gunnery, for the Artillery and the Royal Engineers, it must be borne in mind, constitute the most intelligent branch of the army.

A spacious printing-room and laboratory are here at hand, and all fitted for good work. Everything is bright and clean and in apple-pie order. Captain O'Callaghan, the present Assistant-Superintendant of Experiments, directs the photographic work, and personally takes considerable interest in the operations. Gelatine plates and drop shutters have recently made their appearance at Shoeburyness, and Captain O'Callaghan is sanguine of putting them to good use. There are many ways, indeed, in which instantaneous photographs could be made to record interesting results, if you could only succeed in timing the exposure. The breaking up of a shell against a target, and the question whether a target is shaken on being struck by a projectile, are examples of what is before the instantaneous photographer, and as it is possible, standing behind a gun, to tell whether a shot "wobbles" or flies steadily, perhaps one of these days we shall get a gelatine plate to record this fact also. In the meantime, it can only be said that the gelatine plate and drop-shutter are under experiment at Shoeburyness.

Here is a camera; it is of solid teak, brass-bound, and exceedingly heavy; for the work at Shoeburyness is rather rough, and the jar consequent upon the discharge of a big gun would injure any but sound apparatus. The Staff-Serjeant-Photographer, Serjeant Thomas, has to call in the aid of a truck and an extra pair of hands to transport it to the practice ground, and off it is rundled towards one of the iron targets. The photographer's work just now consists in taking pictures of the face of the target between every round, and as but ten minutes sometimes elapse between the shots, he must needs work quickly and surely. The camera is brought up to the target, the iron structure is focussed, and a plate taken. A hundred yards back gapes a heavy monster ready to belch forth his fire at the word of command, and in these circumstances the work has to be done as rapidly as possible. The lens closed and the dark slide withdrawn, the camera is shifted to one side and left to take care of itself, while the photographer hastens off to his dark-room to develop and prepare another plate. This dark-room is unlike any other. It is a small cell built of timber, and on one side banked with earth; it is, in fact, a bomb-proof, and hardly has the plate been lifted from the slide and the developer poured over it, than a violent boom, terribly distinct, is heard close by, and we know that a shot has been fired, and that the photographer will be wanted again. An exodus is made from the dark little cell, another rush made towards the target, and in a few minutes the photographer returns with a second record. So systematically is the work carried on that, notwithstanding its dangerous nature, accidents at Shoeburyness are of a most rare occurrence; but it is on record that one day the Serjeant-Photographer, with camera on head, not having made his retreat fast enough, was struck—not on the head, but on the camera, fortunately—with a far-flying fragment of iron-plate.

They are always busy experimenting at Shoeburyness, and consequently the photographers are always at work. That is a squad of officers going through the "long course," and those over there engaged in raft-making, in their endeavours to float a gun across a pool, are serjeants and corporals qualifying as gunnery instructors. Everybody is dressed in white canvas clothing, and it is difficult at first sight to tell subordinates from officers. But there is a difference. The officers all wear their snowy blouses loose, while the non-coms. and gunners tuck the tails into their trousers. But all do the same class of work, and work with a will.

There is a range of ten thousand yards over those wet sands yonder—the longest range in the United Kingdom—and this affords excellent practice ground for long shots. If you stand here on a butt behind the gun, as they make their practice, you can trace the course of the shot as it goes making "ducks and drakes" over the water. A graceful spray is sent up into the air every time the projectile touches the wave, and thus a succession of fountains are produced as the shot skims on its flight. There would be little difficulty in taking a picture of this phenomenon; only as the sight lasts some seconds, you would have to make up your mind first of all which part of the spectacle to take.

Little printing is done at Shoeburyness, for the negatives, as soon as taken, are despatched to the General Establishment of the War Department at Woolwich, where copies are struck off, sometimes by the hundred, for illustrating the reports that Shoeburyness is called upon to render in connection with this gun or that target. Here is a series of the pictures. This black looking shot has a history; you see it is perfectly smooth and shapely, and is as perfect in form as a new one. And yet it has been fired twice running through a twelve inch iron plate. It is of compressed Whitworth steel, and beyond the fact that the soft brass studs projecting have been shorn off, the projectile has not suffered in making its way through the target. We might not have believed the circumstance had it been a wood-cut, but a photographic record cannot be gainsaid. A third journey through the solid iron proved too much for our black friend, and in this next picture you see he has succumbed. Here is the "Warrior" target, that is to say, a structure of iron and wood, representing the bulwarks of H. M. S. *Warrior*, before being fired at, and afterwards; here the "Hercules" target, &c., pictures that show us exactly what our ironclads are proof against, and what they not proof against. Here are pictures of batteries and forts, which demonstrate very clearly how well or ill the stone and iron of which they are constructed are likely to stand the heavy artillery of modern days. These pictures of big wood targets, speckled all over, show the damage done by rival shells. There was an argument which shell was the more deadly, and to settle the matter several rounds of each were fired at the targets. Then the impartial camera was called in as umpire to register the result. The officer at Shoeburyness makes his report and illustrates it with these photographs. Their evidence no one can dispute.

The "By-the-Bye" next week will be "Wanted, a Pupil." The following "At Home" will be "At Mr. John Fergus' Establishment at Largs, Ayrshire."

◆

THE WAY TO PRESERVE NEGATIVES AND REGISTER THEM.

BY THOMAS M. LAWS.

To be able instantly to select a particular negative from an accumulated stock of several thousands, and find it as unblemished as when shelved, is an important matter in the conduct of a photographic business. Before dealing directly with the subject, it may be as well to briefly glance at and bear in mind a few causes of ruin which, though well known, are worth repetition. In these days of gelatine plates, however tough they may appear, they nevertheless require more tender solicitude than our late friend collodion. With the growing commendable practice of developing large quantities at a time "after the day's work is done," there is just a temptation to discard the alum solution, which gives strength to the film, or to hurry the fixing and washing.

In the use of bichloride of mercury, there is abundant proof of its stability when rightly used; but, as a hint to those who may be freely using it, just try a silver print from an unvarnished negative so intensified, and the destroying action evident on the paper will be conclusive that further care in its use, and thorough washing, are required.

The best possible mode of storing our plates is valueless, unless every precaution in the removing of destructive agencies in the film itself are complied with. Assuming that the chemical details are familiar, and have been religiously carried out, no more comment is here necessary.

Being the possessor of a constantly increasing store of negatives, every photographer must of necessity adopt some plan of registration, or sustain a serious loss from so much idle capital; a well-ordered negative-room is the mainstay of an establishment, and, with very little forethought and expense, can be in the possession of all. Of course the great enemy, damp, must be specially guarded against in the selection of the desired haven of rest for our years of labour. For this reason an inner room should be chosen where practicable; at any rate, avoid storing negatives against an outside wall, as moisture may ooze through and destroy the films. Dust, insects, and such like foes, are of minor consideration, but ought nevertheless to be scrupulously excluded.

I will now endeavour to state the routine found most convenient, enabling any person, in the absence of the one whose particular duty it is, to find a required "re-order" in a few moments.

It may be taken for granted that, previous to printing, the negatives have been named and numbered from day-book, recommended by your Lady Contributor in "How I Keep My Books." When the order is executed, and a fair quantity are ready for removing—say, weekly or fortnightly—each negative is placed in an envelope, made to size, the flap of which ought to open at the end, not as in ordinary letter envelope. On this flap are written the name and number, or simply the number, and then sorted into numerical order ready for shelving.

For this purpose, a system of racks placed against the walls, and reaching from floor to ceiling, answers admirably. A convenient size for each rack is, say, 8½ feet high (which represents the height of room), and two feet wide; the depth from back to front, about 4½ inches, the back to be boarded as a protection from the wall, and to give stability. Divide into fifteen shelves, which, with half-inch wood, will give a clear space of 6 inches—the height of a pile of fifty enveloped negatives. Each shelf will contain six such piles, equal 300 negatives, which, multiplied by 15 (the number of shelves), will thus allow of 4,500 on each rack. This, for every two feet of wall space, requires very little calculation to estimate the storing capacity of any room.

Where walls are not to be depended on, a modification in the shape of rows of such racks within the room could be adopted. The above is of course for quarter-plates, but is as handy, with increased dimensions, for half-plates; while for larger sizes, it is necessary to have the shelves so divided as to allow of several partitions, against which they may lean in small quantities. The foregoing, when once thoroughly underway, is very effective and simple. The use of boxes is cumbersome and costly, while the system of parcelling batches together necessitates a great waste of time and risk in unpacking and repacking, whenever a negative is sought.

For the purpose of registration, it is best to have a special index-book, made up from the day-book. With a continuous flow of re-orders, such a book, set apart, very much lightens the work. The date, name, address, style, and number need only be entered, a series of leaves being kept for each letter, A B C, &c. In the actual finding of the required negative, then, you seek out name, make note of number, glance through the racks, run your fingers up the envelope flaps (which, by the way, should be left loose), pick out the one wanted, and disturb nothing. Place the empty envelope where it will be readily found again when the negative has done its work.

Besides the regular index-book, it is advisable to have a small one for private use, for the entry of any specially prized portraits or views.

BY A "LOVER OF ORDER."

This matter of preserving and registering negatives, although very important to every professional photographer, seems never to have received much attention, either from photographic journalists, or from their correspondents, at any rate, not anything like the consideration it deserves; and so, failing a communication from an older and better known man, I shall attempt to describe a method which I hope will be useful to many, and which I think will be found both efficient and practical, if given a fair trial.

Without further preamble, I shall ask the reader to step into the dark room at 6 30 p.m. after a hard day's work, to find me varnishing the last negative for the day. I now place all the day's negatives in plate-boxes, and carry them to the reception room, place them on a table, and, having supplied myself with pen and ink, negative bags (envelopes) of different sizes, register books, and a penknife, proceed to mark them, which is effected as follows. A negative is taken from a box, and the name of sitter, the number by which in future it is to be known, and the number of prints required, are all *scratched* into the film with the penknife (this is preferable to writing the name, &c., upon a label, as the latter often falls off, thus obscuring the identity of the negatives). The negative is now placed in a bag, and the same particulars are written upon it, and, in addition, any instructions to the printer or retoucher. The negative in its bag is laid on the table, and the others are now treated in the same way. When this is completed, the register books are taken in hand, and the registration effected in the manner to be presently explained. The register books, if large, are divided into portions of six or eight to a book; but it will be found more convenient to have a number of moderate sized books, and each book or portion is devoted to the registration of names, commencing with a particular letter. Thus, one portion would contain names beginning with A, another with B, and so on. Each page of the register books is divided into five spaces, one for each of the following particulars, viz., the number, the surname, the Christian name in full, the position, and the sized plate; so that an entry for a negative would run thus: 17,863, Smith, Mr. John, head, ¼-plate; again, 19,742, Higgs, Miss Mary, ¾ sit. ½-plate.

When all the negatives have been registered, they are taken to the retoucher, who looks for instructions on the bag, and having removed the negative from it, proceeds to retouch the negative, handing it to the printer when finished and returned to its bag. The printer removes the bag, placing it in a box kept on purpose, and prints the indicated number of prints from negative, and then, having dusted off the latter with a soft duster, replaces it in its bag, and stands it in a pile with its fellows awaiting storage.

The practical reader will now probably notice two things: first, that negatives from which proofs only have been printed do not seem to receive any special treatment, but must be registered with the rest, if the above method is carried out; and secondly, that if the numbering is consecutive on the address book (and it is), that following numbers will often fall on different sized plates. And both of his surmises would be correct; but any inconvenience arising therefrom is easily provided against, as he will presently see.

In piling the negatives previous to storage, the printer is careful to place them in three different piles. In the first pile he places all those from which a proof only has been printed; in the second he places those from which a second order has been received—that is to say, those which have been stored before; and in the third pile he places all those from which a first order has been received. The negatives are stored in boxes made of stout cardboard, each box holding twenty-five negatives, and four boxes are piled one on the other on each shelf, so that a p contains one hundred negatives. The negatives are placed in the boxes in their order according to the numbering, as far as the size of the plates will admit—that is, all the plates in a box are of the same size, and are arranged consecutively, except where another sized plate intervenes; and this plan is adopted with all sizes. Each box bears on one end a label showing the numbers contained within, thus, 15,720-15,751; and each shelf a similar label indicating the numbers contained in the parcels stored upon it, thus, 15,720-16,817.

The negatives in the third pile in the printing room are stored every few days, and those in the second pile are at the same time returned to their respective boxes. Now as to the negative left standing in the first pile, it will be readily seen that if an order is received from any one of them, when the prints are finished, that the printer will of course place the negative in the third pile, and so it will be stored in the ordinary way; but if no order is given the procedure is different.

When more than one proof is submitted, and an order received from one only, a note is made (by the reception room attendant) of the circumstance, and the printer is instructed to remove the unsatisfactory negative or negatives from their bags, and to place the negatives with the wasters, and return the bags to the reception room; and on their receipt there is a line drawn through the particulars on each, and through the corresponding entry in the register-book, and the bags are then used for other negatives.

If each photograph is carefully numbered (to correspond with the address book) before leaving the establishment, no difficulty should ever arise in finding any negative from which an order has been received.

Let us take an example: a lady walks into the reception room, and says she would like some more of her cartes; the attendant asks her name and enters it, and then asks for the number, which, being given, the negative can at once be found; but if the lady cannot give the number—and this often happens—the negative can still be found if the lady knows how her portrait was taken, or when it was taken, for if the surname and Christian names be correctly given, the corresponding names can be found on the register under their proper letter, and if the position there stated corresponds with the lady's description, of course the number of the negative is at once known, and a reference to the address book will supply the necessary information, if the lady can tell on what date she was taken.

It generally happens that the reception room attendant can get some sort of clue, if not the precise particulars desired; and as the register books are at hand, it never happens that a negative cannot be found at all, which is more than a good many photographers can say of their plans of registering. Some photographers object to numbering the cartes sent out, in which case the above plan will still be found effective, as shown in the case of the lady not knowing the number.

With practice this plan should be worked without a hitch by any assistant, the various operations becoming almost habits, and requiring no exertion to carry out successfully.

Papers on the same subject by Mr. J. Harmer and Mr. —— will appear next week.

Notes.

We paid a visit to the Swiss Gallery in Bond Street last week. There is no special characteristic about Swiss painting that we could discover, except that it is rather inferior to the painting of other European artists.

The number of hours of bright sunshine, recorded with Campbell's sunshine instrument during 1880, was 1,214, which is about the average of the past five years as recorded at Greenwich Observatory.

The workers of gelatino-bromide are pretty well divided between pyrogallic and oxalate development. In this country, pyrogallic has more advocates, no doubt; but abroad, and particularly among the first houses of Paris and Vienna, oxalate is the favourite developer. Benque et Cie., of Paris and Milan, a firm not only of the highest rank, but also one of the busiest in the French capital, makes use of oxalate solely, and of Nadar the same may be said. Dr. Heid and Wrabetz, two leading houses in Vienna, employ nothing but oxalate for their portraits; Angerer develops all the "interiors," for which he is so well known, with it, and Haak employs it for his reproductions.

The practice of adding hyposulphite in small quantity to the oxalate developer is decidedly gaining ground. In portraiture, the hyposulphite solution is generally added to the developer at once; but for landscape negatives it seems preferable to use pure oxalate at first, and to add the hyposulphite afterwards. If a negative bids fair to be a little too hard, then a few drops of hyposulphite solution should be quickly added.

The best way to employ hyposulphite for development is, we may remind our readers, to make up a very weak solution, one part of hyposulphite being dissolved in two hundred parts of water. Then a few drops more or less does not make much difference. Eder's formula for the preparation of the oxalate developer seems to be still in general favour.

It is announced that 8,000 francs (£320) have been collected for the monument to Nicephore Nièpce to be erected at Chalons-sur-Saône, his native town. This is irrespective of the sum obtained by the local committee at Chalons, to whom all further sums should be paid.

The first camera in which the first photograph was taken. In one of Nièpce's letters to his brother Claude, in London, bearing date May, 1816, the former thus describes the camera in which the first camera photograph was taken—a pigeon-house, barn, and pear-tree. "The camera," says Nicephore Nièpce, "is a kind of artificial eye, which is simply a square box measuring six inches each way, and furnished with a telescope tube containing a lens."

In making phosphorescent photographs—transparent paper prints backed with phosphorescent paint—Dr. Eder advises the employment of Woodburytypes or collotype prints, for the paint, being a sulphur compound, is apt to attack silver impressions.

Successful photographers naturally gravitate towards civic honours. Mr. Alderman Nottage and Mr. Alderman Mayall are well known among us, and in Scotland we find that one of the foremost photographers—Mr. Stuart, of Glasgow and Helensburg—holds the appointment of Provost (chief magistrate) of Helensburgh.

Panoramas and dioramas are the order of the day. The "Charge at Balaclava" has been followed by "Waterloo" and the "Siege of Paris." The deception of the eye is most complete in all of these works; and even by means of a powerful opera glass it is impossible to distinguish between the real properties and the painted ones.

But if it is easy to deceive the eye, the camera is not to be hoodwinked. We once saw a photograph of the panorama of Constantinople that used to be shown at North Woolwich Gardens. When this was first painted, the sky of the picture harmonized so well with the real sky above, that the join was imperceptible to the naked eye. But in the photograph it was different. The lens focussed every detail clear and sharp, and the photograph showed plainly enough the clumsy screen of canvas and plaster against the sky.

The panorama mania, like history, repeats itself. About the time of the Crimean war, London was full of panoramas, and then, as now, they were the works of French artists. In fact, the panorama or diorama only dates from the beginning of the present century, and, strange to say, it was Daguerre who first succeeded in producing the wonderful effects of nature in this mysterious manner. Daguerre had made a name for himself in the construction of the Paris Diorama many years before Daguerreotype was published to the world, and his investigations into the behaviour of light were, indeed, undertaken in connection with his diorama work.

The funds of the Photographers' Benevolent Association are augmenting surely, if slowly. We believe that in future no grants will be made but to members of the Association, for in the early days a goodly sum was expended in compassionate allowances to unfortunate assistants who had no claim whatever for relief. This is a very wise rule indeed, for if it came to dispensing charity all round to everybody connected with photography, there would be no limit. "I have not been engaged in photographic work, so to speak, but I have frequently been photographed," might be advanced one of these days as a claim.

Fan painting has always been regarded one of the most delicate branches of the fine arts. Passing along Bond Street last week we noticed a pair of exquisite fans, the centre being made up of two female figures limned with much grace and animation. But the grace and animation were the work of the photographer, and not of the painter, for we recognised the coloured pictures at once as productions of the Maison Nadar, in Paris.

When in Edinburgh recently, Mr. Marshall Wane showed us a handy piece of travelling apparatus for dry plate work. It was simply a double plate-box, or box with two divisions and two locks and keys; as the plates were exposed, they were transferred from one division to the other. You never made a mistake between an exposed and unexposed film, and all of them were safe from prying eyes.

The Art and Industrial Exhibition at Plymouth has awarded a silver medal—the highest award in photography—to Mr. H. A. H. Daniel, the hon. secretary of the Bristol Society.

A scientific fable is a novelty, especially one with a good moral, such as Mr. W. S. Gilbert has written in *Patience.* A magnet, it seems, dwelt in a hardware shop surrounded by loving needles and nails and knives, all longing to embrace him. But he was proud, and, soaring above his station, tried to attract a silver churn. The consternation of the ironmongery must be quoted to be described.

> "And iron and steel expressed surprise,
> The needles opened their well-drilled eyes,
> The pen-knives felt 'shut-up,' no doubt,
> The scissors declared themselves 'cut out.'
> The kettles, they boiled with rage, 'tis said,
> And every nail went off his head,
> And hither and thither began to roam,
> Till a hammer flew up and drove them home."

When too late, the magnet found out its mistake, and the moral is quite pathetic:

> "This most æsthetic, very magnetic, lover, he lived to learn,
> With no endeavour, can magnet ever attract a silver churn."

Topics of the Day.

A BALLOON TRIP IN A THUNDERSTORM.

BY W. COBB.

Probably it seldom falls to the lot of anyone outside the pale of the very limited number of professional aeronauts to make an ascent in a balloon during a thunderstorm; such, however, was my privilege—or, as some of my friends prefer to call it, my foolhardiness—on Monday last, when I had the honour of sailing away with the President of the Balloon Society of Great Britain in the good aerial ship "Reliance," from the grounds of Lillie Bridge, West Brompton, and not from the Alexandra Palace, as announced in some of the daily papers. Of course the primary object of my ascent was to secure photographs from different elevations; but although every facility was afforded me by the President, and also the aeronaut, Mr. Barker, for the attainment of my object; having provided myself with plates of such rapidity as under ordinary conditions would have ensured success; and finally, lashing my apparatus securely to the side of the car, so as to be ready for immediate action—it was all to no purpose, owing to the combination of untoward circumstances which arrayed themselves against me.

In the first place, the ascent, which had been arranged to take place at five o'clock, was obliged to be postponed until past seven, in consequence of the very limited supply of gas; this in itself would have formed a sufficiently valid excuse for my not succeeding; but add to this the fact of the elements themselves being, as it were, at war with each other, and consequently by no means in harmony with my project; and last, though not least, the smash-up of my apparatus, it can hardly be wondered that my photographic results were *nil.* However, as there is luck in odd numbers, I am anxiously looking forward to my third voyage as the crowning point of my ambition in this particular direction.

At a quarter-past seven o'clock, all the necessary arrangements for the start being completed, the aeronaut looked somewhat anxiously round at the weather, shook his head, and then looked at the President, and it required some little pressure from the latter to overcome the scruples which the state of the weather had engendered.

Arrangements had been made for a lady to accompany us, but, at the last moment, much to her disappointment, the idea was abandoned. Almost immediately after rising, I exposed half a dozen plates as a kind of forlorn hope, feeling conscious at the time I might have spared myself that trouble. After all, I received a certain amount of compensation for the disappointment I experienced. Giving myself up to the enjoyment of the scene which surrounded me, I soon became lost in astonishment; it was truly magnificent in its grandeur; it really seemed as if nature herself was setting at defiance the laws which govern her, and was running riot. Huge masses of clouds were tumbling and rolling over each other in wild and glorious confusion; a wide expanse of deep ruby background gradually merged itself into a thick, impenetrable haze; whilst in another direction torrents of rain were falling so as to partly hide the view, yet giving additional intensity to the effect.

Whilst recognising the fact that wonder is the offspring of ignorance, it is nevertheless strange that, by being continually surrounded with objects and scenes of the most marvellous description, we soon cease to wonder at or even admire them. Doubtless this is the case with the few who have the opportunity of witnessing these grand effects of nature. With them familiarity breeds contempt, and the things which produce in the minds of those who behold them for the first time feelings of the most profound admiration and wonder, are regarded by such as commonplace and without interest.

We rose very rapidly, and, reaching an altitude of about two miles, were soon in the clouds. Suddenly we were all somewhat startled by a strange noise, apparently not very far from us. After speculating for a few seconds as to its probable cause, we discovered we were passing through a violent snowstorm, and our pilot suggested that the noise might be occasioned by the beating of hailstones against the balloon; this theory proved to be correct, for, on subsequently opening the valve to let off gas, a shower of them came straight through the balloon, and fell into the car at our feet. I never before felt the cold so severe in the month of June as on that day. Our aeronaut was evidently somewhat ill at ease, as he volunteered the statement that he did not like the look of things at all, for although he had made a great many ascents, he had never before been up under such trying circumstances, and bade us keep a sharp look-out for land below. We remained in this isolated position for a considerable time, apparently stationary; our President then let fly some carrier pigeons which he had taken up for the purpose. These, after hovering about for several minutes, as if undecided whether to return to the car, or venture forth in search of brighter prospects, ultimately chose the latter alternative, and we saw no more of them. We had now reached the summit of the clouds, and were rewarded with a sight of bright and cheering sunshine, and a very perceptibly warmer atmosphere. Again we emerged into obscurity; but after a few minutes, sighted land below, and water too. After a little puzzling, we made out that we were hanging over the Thames, not far from Battersea Park. For a considerable time we seemed to remain at this particular spot, the balloon, however, gyrating very rapidly. Here was evidently no place for landing, so, parting with some of our ballast, we soon found a current which took us farther a-head, where we sighted a cemetery and a railway, with trains running immediately beneath us. Beyond these a meadow presented itself to our view; here we decided, if possible, to effect a landing.

Having already deposited my camera in the bottom of the car, and receiving the customary orders from the pilot, "Whatever you do, hold on!" we began the descent. It was a sensational one, to say the least of it, and the bumpings hard ones, to make the best of it. The first bump landed my camera in irregular sections on *terra firma*, and I suppose a kind of sympathetic impulse forced the dark slides to follow suit; but, as self-preservation is acknowledged to be the first law of nature, I parted company with them, without even a struggle on their behalf. Suddenly I received—well, "a touch, I do confess," on the back of my head, which had the effect of causing me to relax my hold of the ropes, and rendering me for the moment half unconscious; but a sudden shout of "Hold on!" from our chief caused me to regain my grasp, which I succeeded in maintaining until we were fairly landed. We had each of us sustained a good shaking, but were able to congratulate each other upon having had "a lucky out of it," at the same time expressing our conviction that it was a providential circumstance that the lady already referred to had been subjected to a bitter disappointment. A crowd of two or three hundred persons soon surrounded us, which was very ably manipulated by Mr. Barker, and, after seeing the balloon packed into the car ready for transport on the following day, we wended our way homewards, not much the worse for our very sensational outing.

The "Topic" next week will be "Vignettes and Vignetting," by Geo. Bradforde.

◆

A DAY WITH THE "SCOTS GREYS."

BY GEO. BRADFORDE.

It was after Cromwell, with his "Roundheads," had scoured Britain with fire and sword, and while the staunch old Covenanters still read the Bible in glens and hollows, with their bare claymores laid across their knees, that the gallant Scots Greys were first incorporated. The origin of the title, I am given to understand, springs from the fact that in 1681 the first troop—the real nucleus of the regiment—were all mounted upon grey horses, and, as may be supposed, the men were all Scotchmen. It would be out of place to mention here the numerous heroic achievements of this glorious regiment. Yet, let me mention on this, the bi-centenary of the regiment, and the sixty-sixth anniversary of Waterloo—a day held in reverence by the Greys, being the day on which Sergeant Ewart captured the French standard, the origin of the eagle that they now wear upon their buttons and standard. Gallant, glorious fellows! Well may you be proud of your motto—"Second to None." By my faith! When I saw you parade on the great open square—when the helmets were glittering in the sun—the swords flashing—the band playing, I felt my bosom swell, and I wished that I was one of—your officers.

It was a splendid day. Just a little too much sun, and a little too much of the frolicking wind. But that mattered little: everything was so far in our favour. Listen to the great band! Did you ever hear anything like it? It sounds and resounds from every corner of the great Royal Barracks. It thrills you to the soles of your boots; it stirs your hearts; and you lend a loving ear to the strange echo that is wafted back from the busy capital of Ireland. Hark to the roar of the gallant colonel as he puts them through their evolutions! How the deuce do the men know what he says? It seems to my unmilitary ears a series of unmusical shouts, and at each burst the great mass move as if they were some immense automaton worked by strings, the principal operator being the bronzed, wiry warrior who stepped so majestically about. At last, with one immense shout or two, the whole four squadrons spread themselves over the square, and went through the sword drill or exercise. I shall not forget that scene in a hurry. It is not every day that a peaceable man sees nearly a thousand swords flashing, slashing, poking, posing, stabbing, and doing all manner of murderous execution. I was not afraid; but somehow I remembered that once I went to photograph a crack volunteer company, and some lunatic left the ramrod (it was before the breech-loaders) in the barrel; they were to fire a *feu de joie*, and this individual tapped a barrel of cider within ten yards of me. It was very refreshing, but there was a miserable feeling somewhere; whether it was selfishness or ingratitude, I could never make out. Remembering this, you must not think that it was cowardice that made me step gently behind a pillar of one of the porticos when those swords were careering. Oh, no! it was only prudence.

After this the business of the day commenced. Two squadrons were drawn up in line with the band. Now this, with a 5D Dallmeyer, was more like taking a view than a group—the figures as you may suppose, being scarcely higher than the nail of your little finger. These plates were so far failures, owing to the lack of a shade shutter—a mass of white sky towering over the tops of the barracks that was bound to fog something even less sensitive than a dry plate. I did not use one because I had not got one, and to try a substitute with an almost instantaneous exposure, and so much wind blowing that I had to steady the camera with one hand, was an impossibility. Passing over these, we next took some 12 by 10 groups, first of the officers, and then of the band. I would not mention these at all were it not to caution others who may fall into the same mistake as myself. With regard to lens: what have we to guide us but the trade catalogue? Are we to believe it, or are we not? I was comparatively a stranger in the studio from whence the lens came that I was destined to work with; but was informed that it would cover 12 by 10. I may at once cut the thing short, and state that it did *not* cover my 12 by 10 groups, although I used the third diaphragm. The centres of the plates were fully exposed and sharp, while the outsides were thin and messy. I mention this, as I said above, as a caution; for indeed I should have tried the lens before I took it to the field, and I advise others to do the same, whoever the maker may be. This was a lens that had been for years in the firm's hands—had been worked for whole plates and 10 by 8, nothing larger; then how was I to know but that its advertised powers were correct?

With a good deal of dodging in the printing we can make very passable pictures, but still, had the lens done what was represented, it would have been easier for the printer, and more pleasant to everyone. After I had taken that wonderful band—where every conceivable instrument in Heaven's earth seems represented, from the awful French horn to the tiny picolo, from the big drum to the bass viol, from the sweet trombone to a host of antedeluvian-looking instruments; we had sundry odd jobs to do with the officers. One particularly good result was a young swell in a trap driving tandem: it was done in a strong light with a flash, and the result is admirable.

As far as I remember, it had just struck one, when my eye caught sight of a majestic procession passing through one of the stable yards towards the band room; they were bare-armed, and carried strange utensils between them: they seemed hot, but were very solemn withal. With that wonderful instinct that made me famous in my youth, I followed, determined to see the end of it, or die in the attempt. Fancy my amazement when I found that it was merely the dinner! I declare I was quite taken aback, but—it was a very fine dinner.

◆

Correspondence.

WORK AND WAGES.

Sir,—I have read your interesting "By-the-Bye" in last week's News, and I wish others would discuss the matter of "Work and Wages" too. I have been four years a printer in a large house, but my wages are now only 14s., although I do delicate vignette work. When I first came, I had 7s., and only had this for two years; but now I do not see any prospect of bettering myself. I think there should be some regular scale of pay for printers. The Cambridge printer you talk about, who had £3 3s. a-week, is a lucky man. I do not think there are many such now.—Yours truly,
A Printer.

Dear Sir,—Your division of labour is, I don't think, correct. Many photographic establishments have operators who only develop, but develop well, and get good wages. A French gentleman who is now in London earning a good salary, told me that he received 200 francs a-month for laboratory work. He did not pose, or even enter the glass room under ordinary circumstances, but he had to see that the plates were properly coated and developed. He was the technical assistant. I think it would be well to divide assistants into two classes: art and technical.—Your obedient servant,
Technical Operator.

Dear Sir,—Permit me to say, in reply to "G. H. J." of last week, that if he takes about eighty sitters per week, and retouches the work himself, I should say his time was fully occupied. I find every one of my customers selects two or three plates; that makes retouching of (say) at least three negatives. How can "G. H. J." manage them? Eighty negatives mean no small business—quite thirteen per day—and should a wet day crop up, how about twenty-six the next day for certain?

Now I never did retouch, but worked from behind the camera, as I found twelve or thirteen sitters a day quite enough, without retouching negatives. But work is done so rapidly now-a-days; and I should like to know how many negatives are considered a fair day's work for a good retoucher, who has nothing else to do. My head retoucher gets paid much more than the quotation in your article on the subject of "Work and Wages," and I find that from twelve to fourteen negatives are all that get done in one day, and not so many if they are cabinet heads.—I am, yours truly,
H. J.

Dear Sir,—Would you be kind enough to inform me whether it is usual to give Bank holidays, or any other general holiday, to operators or general assistants who are paid weekly; or is it not general to give any holidays to the trade during the year? If you would be kind enough to furnish me with an answer at your earliest convenience, I shall be greatly obliged to you.—I remain, yours obediently,
W. H.

[No doubt some of our correspondents will kindly answer this question.—Ed. P. N.]

GELATINO-BROMIDE AT A DISCOUNT.

Dear Sir,—If "Thick Head" worked the gelatine emulsion process in the thorough manner which he affirms in your last issue, it might indeed be difficult to render him any assistance.

I think with you, sir, that more careful attention in the manipulations would dissipate his troubles.

Let me, however, supplement this hint with the statement that what would be a correct normal quantity of ammonia for developing a plate which is rightly coated with emulsion, would prove an excess in the case of one too thinly coated, and likely to culminate in defects such as described by "Thick Head."

I might suggest, as the cause of this, that in developing, the excess of ammonia continues to render active the pyrogallic de-oxydizing agent until the parts of the film unaffected by light, being so thin and having no power of reabsorption, are utterly deprived of the protection of their component parts of oxygen; and the liberated silver readily deposits in its metallic state on any suitable impurity existing in or on the glass itself, while the gelatine, being in a state so thoroughly alkaline, is liable to become the refuge and support of any foreign chemical matter that may have affinity for either itself or the free silver, and result in such discolourations or stains as make themselves familiar to "Thick Head" and others.—I have the honour to be, sir, yours very truly, LYDDELL SAWYER.

REDUCTION OF OVER-PRINTED PROOFS.

DEAR SIR,—As an answer to Mr. Brooks respecting the use of cyanide of potassium and chloride of gold for the above purpose, I send you a mounted stereoscopic slide, which I have found in the collection of a friend. This slide was printed, toned, and fixed, and afterwards reduced by the cyanide and gold, in the year 1864 or 1865, and is consequently sixteen years old. Referring again to M. Faure, he says: "This kind of toning—for it really is one—is good for red proofs, the colour of which arises from want of toning. By its employment we can obtain a violet black, or ink black, or pure black hue, according to the time of immersion, and this, too, without impairing the quality of the whites."

At the time the above slide was printed, strong 60 or 80 grain silver baths were in vogue, and possibly the commercial sensitive papers of the present, prepared on weaker baths, and for keeping purposes, will not stand the treatment so well. I have not tried the method for several years, but will do so, and report progress. The formula seems to be just one of those empirical ones which crop up from time to time, and which are difficult to explain theoretically at first. Let me instance the use of cyanide in correcting a defective nitrate bath, or the still later one of Captain Abney's—the employment of hyposulphite in the development of gelatine plates with ferrous oxalate.—Yours truly, GEORGE LEWIS.

[A charming little picture of a roadside inn, taken in 1863, on a tannin and honey plate, accompanies Mr. Lewis' letter.—ED. P.N.]

DEAR SIR,—Having omitted to state how much salt and water I use in my reducing bath, I now send the full formula: ten to fifteen ounces of a saturated solution of common salt and water; four to six grains of cyanide of potassium, and two drops liquid ammonia, ·880.

In answer to Mr. Brooks' question, the salt and ammonia keep the prints from turning yellow, which they would do if only the strong cyanide were used.

Perhaps Mr. Coles will not think ten to fifteen ounces of salt and water sufficiently definite, so I give him the same advice as Mr. Cobb does to workers of his dry plates: not to use exactly a stated amount of this or that chemical, but to use them with brains. If Mr. Coles does so in connection with my reducing bath, he will be sure to meet with success.—Yours truly, HERBERT H. HARDING.

A COMPLAINT FROM INDIA.

SIR,—I should be much obliged if you would kindly let me draw the attention of dealers in photographic materials to the necessity for a little more punctuality and business-like qualities in sending out the articles to India or elsewhere which may have been ordered by letter.

I have myself tried four separate firms in the last two years, and in every case have met with the same want of attention, and delay in executing my orders, although cash has always been sent in advance, except in the first case. The results have been as follows:—

1.—Order sent 1st January, 1879, for a large camera and sundry apparatus and chemicals of sorts. A solid bodied camera was sent in place of a bellows body; glass plates of sizes not corresponding with the inner frames of dark slide and printing frames; a scratched view lens instead of a portrait lens, and so on nearly all the way through. The order, although for ordinary things that every dealer keeps in stock, was not completed until September, or nine months after date of order leaving India.

2.—An order was sent in May, 1880, for some collodion emulsion and other articles. The cash was sent with the order, and an acknowledgment was received from the dealer by return of post, and further information promised by next mail. From that day to this not a word has been heard. Some three months or more afterwards a firm in Madras advised that a package had arrived to my address, and asked for a list of contents to enable them to pass it through the Customs. No invoice had reached me or them, and I had not kept a copy of what I had ordered; it was therefore with very great trouble and worry that I got the box through unopened. I don't know at the present time whether all the things I ordered were sent; and although I included in the remittance what I thought would be sufficient to cover packing and freight by India parcel post, I had to pay, I think, some fifteen or seventeen Rs. on arrival, for freight and other charges.

3 and 4.—On the 1st March of this year I sent to two separate dealers for a packet of gelatine bromide pellicle, remitting the money by the same post—my letters must have reached their address about the 22nd March: one of the dealers has never replied up to now (twelve weeks). The other wrote on the 22nd April (a month after he got my letter and money) merely a bare acknowledgment of the cash, but no signs as yet of the gelatine bromide. I have since sent an order (and the cash) for some gelatine bromide paper to another firm, and am wondering whether this will share the same fate.

All these orders, small and large, were sent to well-established dealers, and I am therefore at a loss how to order anything from this side with a chance of getting them out quickly and correctly. Sending the money in advance seems only to cause a dead silence.

I have not mentioned any names in this letter, as I don't wish to cause any unpleasantness. I would rather leave it to the parties themselves (if they see this) to attend a little more to their customers in India.

A friend here, and myself, are both in need of several things, but don't know to whom we can trust to forward them; and the main object of writing this is to arrive at some reasonable plan for getting out photographic material direct from the dealers quickly and correctly. We are willing to remit the money in advance if we are sure to see the value returned speedily, but not otherwise. Photographic material is not like oilmen's stores or such things as can be ordered through an agent. Some technical knowledge is required in the purchaser, or mistakes will invariably occur.

I shall be glad if this letter elicits a reply from some of the firms in England, able and willing to undertake export business in a proper way.—Yours faithfully,

FRED DUNSTERVILLE.

Proceedings of Societies.

THE THURSDAY EVENINGS AT ASHLEY'S HOTEL.

LAST Thursday's meeting having been announced for a shutter exhibition, there was a good attendance of visitors, and a very fair list of exhibits was laid before the chairman (Mr. COBB).

Mr. ASHMAN exhibited a studio shutter, made for him by Mr. Orford, and which he had had in constant use since 1878.

Mr. COWAN exhibited two shutters, one of which had also been in use since 1878, and by its means, at least 15,000 pictures had been taken; he also exhibited a small pocket battery.

Messrs. MARION and Co. sent Cadett's and Chadwick's shutters.

Messrs. HUNTER and SAND'S shutter was exhibited by Mr. Sands; he also showed some prints from negatives of Swan's, Epsom Race Course, &c., taken with this shutter by Mr. C. Jones.

Mr. HOPKINS exhibited a shutter by Mr. Lodman, an amateur residing at Dorking.

Mr. FALLOWFIELD brought Jackson's shutter (by which the celebrated Swan pictures, and the Flying Dutchman were taken).

Mr. ORFORD brought four shutters for studio use, and a small portable battery.

Mr. J. A. HARRISON produced a model of a shutter, which was a marvel of simplicity, ingenuity, and efficiency.

A letter was read from Mr. Jarman, promising to exhibit his cheap electric lamp at the next meeting.

A vote of thanks to the chairman and exhibitors, proposed by Mr. Le Fevre (the president of the Balloon Society of Great Britain), and seconded by Mr. Ayres, terminated a very pleasant and instructive evening.

Edinburgh Photographic Society.

The Annual Excursion of the Society will be to Gosford, on Thursday, 7th July, by train from Waverley Station (N. B. Rail), at 9.20 a.m., returning from Longniddry at 7.42 p.m. Tickets—Gentlemen, 10s., Ladies, 6s. 6d. (which include luncheon, dinner, tea, &c.)

The Committee are arranging suitable games, for which prizes will be awarded to successful competitors.

Tickets may be had from Mr. J. M. Turnbull, 19, South St. David Street, up to Tuesday, the 5th, and also from the members of Committee:—Mr. James Howie, 60, Princes Street; Mr. Frank P. Moffat, 125, Princes Street; Mr. Thomas Pringle, 103, Princes Street; Mr. Hugh H. Pillans, 12, Dryden Place; Mr. F. Briglmen, 12, Giles Street; Mr. G. G. Mitchell, 25, North Bridge; Mr. Wm. Rankin, 11, Spence Street; Mr. James Small, 33, York Place; and the Secretary.

No tickets will be sold after Tuesday, the 5th July, and as none will be admitted to the grounds without one, it is absolutely necessary that tickets be secured before this date, to enable the Committee to get their arrangements completed.

Time Bill.—Music and dancing at intervals during the day. 9.20 a.m.—The start; luncheon about eleven; immediately thereafter, a group of the company will be taken; 2 p.m.—Dinner; 5 p.m.—Tea; 7.42 p.m.—Start for home.

Malcolm Gillies Dobbie, Hon. Secretary,
8, Rosehall Terrace, Dalkeith Road, 18th June, 1881.

Manchester Photographic Society.

The second out-door meeting of this Society (this season) was held at Bolton Woods, Yorkshire, on Saturday, the 18th inst.

Owing, no doubt, to the gloomy aspect of the morning, and being so soon after the Whitsuntide holidays, the party was not very numerous. Nine, however, met at Victoria Station, and left by the 9.30 train for Skipton, thence by waggonette to Bolton Abbey, the atmosphere being very much clearer and brighter than when at Manchester.

Several plates were exposed in the Abbey and surroundings, after which the members retired to the Devonshire Hotel, where an excellent cold luncheon had been provided, and was enjoyed by all present. At the same time a very heavy shower of rain cleared away the dust and mist in the distance, and, on rising from lunch, the rain had abated, and the sun lit up the river scenery and the woods magnificently. A stroll to the Strid was then fixed upon, and on the way many plates were exposed. Although the walk was a long one (after such a hearty regalement), the distance seemed shortened by the interest and pleasure taken in the selection of pictures.

None of the party having been over the ground before with the camera, all was new, and one experience gained was, that another time they would endeavour to drive direct to the Strid, and walk and photograph down to the Abbey, the light being better suited for most views earlier in the day.

The party left by the 8.15 train from Skipton, and so ended a very enjoyable excursion.

The next meeting will be on Saturday, July 2nd, to Dunham Park. Members should endeavour to go by the 1.15 train from Central Station.

Bristol and West of England Amateur Photographic Association.

On Thursday, the 16th inst., the first out-door meeting of the Association for this season took place, the resort selected being Tintern.

A fair muster of members took place at the Temple Meads Railway Station, and proceeded by the train leaving at 9 o'clock.

Having arrived at the New Passage, the run across the Severn by steamer to Portskewet was much enjoyed. Arrived at the latter place, a good view was obtained of the extent of the destruction of the wooden railway pier by the fire (supposed to be incendiary) which took place last month. More than half of the pier being destroyed, and it being the first day of the resumption of traffic by the old route, all passengers and luggage had to pass over a temporary platform on the top of the new piles. Arrived at Portskewet Junction, the company had to wait some minutes for the train, and by this time the rain, which had already announced itself by a general heavy dulness, came on in earnest, and at a very early time in the day's proceedings caused forebodings, which, unfortunately, were fully realised. However, long before this, diverting "yarns" had been pretty plentifully furnished; and one of the members thought, while waiting, a photographic joke, lately enacted in the city, might amuse those present. Being rather good, we give it *in extenso.* A thriving tobacconist, who is quite a character in his way, living in one of the few shops now left in Clare Street (a great banking and insurance street), is evidently a "late riser," his shop not being opened till long after many of his neighbours have begun the day's bustle. One morning he was much later than usual, and a wag, noticing the fact, procured a large sheet of paper, and affixed it to the front of the shop, after having printed upon it the words—"He is not dead, but sleepeth." A firm of photographers close by considered it an opportunity not to be lost, and using a window opposite, perpetuated the joke by photographing the shop front entire, and having a hastily-prepared print or "gem" picture ready for "he who was not dead," immediately he appeared at his "receipt of custom" with his usual weed, sent it with their compliments and congratulations.

The train waited for non-arrivals, and the journey continued, when a whistle and a rush into a rather long tunnel announced that the Wye Valley Line was being traversed. On emerging from the tunnel, the river Wye and richly wooded Wyndcliff suddenly came into view in all their beauty (for although the rain was still literally pouring down, the view was most beautiful). A few more minutes, and the glorious old Abbey of Tintern burst on the view as the train winds round yet another of the many sharp turns which do so much to give a charm to the little Wye Valley Railway, at all the stations of which the roses flourish in such profusion, from the delicate Devoniensis to the rich, deep-coloured Damask Rose, and give the booking office window or the signalman's box a far more poetic and artistic appearance than they can usually boast.

Fortunately, the rain ceased just long enough to allow the members to have a ride in dry weather from Tintern Station to the Beaufort Arms Hotel in the village. No sooner, however, had they arrived and settled down with praiseworthy earnestness to the charms of lunch, than the rain again came down in the form of pitchforks, and with all the appearance of continuing for the rest of the day.

With, however, the excellent fare of such a "goode olde hostelrie," the festive "goaks" of the company (amongst whom was a brother amateur in distress from Cheltenham, invited by the Honorary Secretary to join the Association at lunch), time was effectually killed till the Vice-President (Mr. T. Davey) remarking that, unfortunately, much as it would help to pass the time, they could not keep eating till the time for the return train, suggested a cessation of hostilities, and a ramble in the wet for those who cared for it. Disgusted with the weather, and tired of being indoors, all turned out, and although every member brought a camera, not one was taken out, mackintoshes being much more to the purpose. Everyone having done his best to get wet through, it was decided that the return should take place by the first train going, and the members having indulged in the cup which cheers but not inebriates, took their seats in the break for a drive in a "drizzle."

Having boarded the train, all took comfort from the "fragrant weed," and amusement from more "yarns," some prosy and proper, some naughty but nice, others ticklingly terse, and told fully twice.

Having reached Portskewet Pier Remains, on the return journey, the members were much interested, while the luggage was got on board the boat, in watching a diver descend to the bottom of the water to fix chains to sunken trucks, engines, &c.

The rest of the time of the return journey was employed in determining the place for the next out-door meeting, and it was ultimately decided that Varleigh Castle and village should be visited in July, the Association taking train to Freshford Station, and walking up the bank of the river (three miles) to Varleigh.

A vote of thanks to the Hon. Secretary (Mr. H. A. H. Daniel), for carrying out the arrangements, and a vote of censure for not providing better weather, were then passed, to which he replied, thanking the members for the former, and refusing the latter, preferring to send it on to the *New York Herald*.

On the arrival at Temple Meads Station, each betook himself to his "ain fireside" (for it was quite cold enough), "a sadder and a wetter man."

Talk in the Studio.

Photographic Society of Great Britain.—The next Technical Meeting of this Society will be held on Tuesday, June 28th, at the Gallery, 5a, Pall Mall East. The chair will be taken at 7·30.

Dundee Exhibition.—Last week we published the conditions and prize list of the Dundee and East of Scotland Photographic Association's Exhibition. We can fairly congratulate the Council on the equity of the conditions and the liberality of the prize lists; the former appear to be framed upon the rules of those exhibitions which have been held throughout the kingdom and have given the most satisfactory and successful results. The prize list, which contains somewhat novel items, is a liberal one, two gold medals being offered in place of the single honour usually awarded; the Dundee Council deeming portraiture and landscape work equally worthy of the coveted gold. The prizes in silver will be eight, and there are eleven bronze medals. The list should tempt a large number of our brethren, both professional and amateur, to enter the arena; indeed, we learn that there are already upwards of one hundred and fifty promised exhibitors, including some of the most distinguished names in the three kingdoms. The Albert Institute, in which the Exhibition is to be held, is a large and elegant building, the property of the Town, and comprises museum, picture galleries, and library. The Council are giving exhibitors ample notice, as the time for opening is February 10th, 1882. A preliminary advertisement, which has already appeared in our columns, refers to the Hon. Sec., Mr. Charles Johnson, 45, Nethergate, Dundee, for any information required. We believe since the International at Edinburgh, four years ago, no exhibition so important has been held in Scotland, and we sincerely wish our friends of Jutiopolis every success in their spirited undertaking.

Photography as a Safeguard in Russia.—The *Times* on Wednesday, in giving an account of the arrangements made to guard the Czar from harm during a journey from one stronghold to another, says that such is the fear that dynamite may find its way under the rails, that there are sentinels at every half verst. "Besides this, the photographs of all the railway officials, not only on this line of railroad, but on all the others, are lodged, to the extent of very many hundreds, in the Ministry of Ways and Communications, so that any Nihilists disguised in railway costumes may be the more easily detected."

The Primary Colours.—At the *Academie*, M. Rosensthiel recently discussed the distinctive character of these colours. Certain properties attributed to primary colours do not belong to them exclusively, *e.g.*, their producing all perceptible colours when mixed two and two, and the sensation of white arising from the three fundamental sensations being excited equally. The fundamental property of the primary triad is stated to be that colours situated on either side of a primary colour (in the graphic triangle) and equidistant to sight have their complementaries so near together that it becomes difficult to distinguish those which are consecutive.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Co. Account.*"

*** A cheque for two guineas will be given for the best practical essay, "How I Retouch and Varnish My Gelatine Negatives." Contributions must be sent in not later than 1st July. For rules, see previous Nos. of the News.

G.—One part of gum-dammar dissolved in from eight to twelve parts of benzole.

Eager.—1.—We are acquainted with one London firm which is now working the process, and we have seen it carried out commercially in Paris. 2. As far as we know, the gentleman in question has not made any announcement on the subject. 3. You do not state the purpose for which you require the roller.

J. Z.—Cut the gutta-percha in pieces, and put it in a bottle with eight times its weight of carbon disulphide. When the solution is complete, allow the liquid to settle, and pour off the clear portion.

W. W.—1. Your new method will probably be found to answer satisfactorily, but you must not expect to attain constant success without a considerable amount of steadfastness of purpose and perseverance. 2. It is extremely energetic in its action, and must therefore be used with caution, if, indeed, at all. 3. Why not line them with thin gutta-percha?

F. B. A.—It is difficult—or, rather, impossible—to state in figures how many times a given gelatino-bromide plate is more sensitive than an ordinary bath plate. Not only do bath plates vary much, but the rays which exercise a maximum effect on a gelatine plate are by no means the most powerful in the case of a wet collodion film. You must therefore regard the numbers as only approximate.

Experimentalist.—Dissolve 6 parts of gelatine in 100 parts of water, and add 1 part of ammonium bichromate. Coat the plates with a thin film, dry, expose, and soak in water. When again dry, a faint image will be visible. To intensify this, damp the plate, and dab it gently with a pledget of cloth charged with a small quantity of printing ink. In the case of any difficulty, write again.

Capt. Turton.—1. You had better obtain some of Vogel's gelatino-collodion emulsion, which is sold by Rouch. 2. It is not likely to have been unwashed. 3. We shall be very pleased to receive an account of that to which you refer.

Onward.—You will find full information in our Year-Book.

J. Harris.—1. A quarter of an ounce to half a pint of water is a fair proportion. 2. If exposed to the air for a long time it will become useless.

A Subscriber.—The information you require may be gathered from our advertisement columns.

J. Jones.—The "ditto" applies to the figure as well as the word; so the quantity of glycerine is one ounce.

W. Edmondson.—1. Any one of the numerous forms of enlarging apparatus described in our columns will answer. 2. Apply to a dealer in photographic apparatus.

J. M.—The copyright holds good during the life of the producer, and seven years after. If you take any picture at your own expense, and for your own purposes, the copyright belongs to you; but if, on the other hand, you are employed by a customer to execute a picture, the copyright is his, the work having been done at his expense, and, in the eye of the law, by him. The circumstance of your having resided out of Ireland for a short time does not affect the question in any way. Your solicitor should obtain the Act bearing on this question (1862, 25 and 26 Vic., cap. 68), as it appears that when the first commercial transaction is made in regard to a copy, a memorandum should be made regarding the copyright.

John Jones.—You should be able to obtain very fine transparencies in the way you propose, and they may be toned by the usual acetate of soda toning bath.

Joseph Barton.—The propriety of such an addition to the bath is very doubtful, and we know of several cases in which those who strongly advocated it, have themselves abandoned the practice.

Nitrate.—The reaction only sets in when the heat approaches whiteness; but, once commenced, it proceeds very rapidly.

Jelly.—The setting property has been destroyed by the prolonged action of heat.

B. Cadman.—The body of the dish, being made of a porous material, has become saturated with silver, as you suppose. But your letter leaves us in doubt whether you wish to remove the silver, and restore the dish to its pristine condition, to sacrifice the dish and recover the metal, or to attain both ends. If you yearn for a means of occupying your spare time and spending your surplus cash, and you possess an abundant gift of patience, we shall have much pleasure in giving you detailed directions with respect to this matter.

Learner.—When a solution of nitrate of barium is mixed with ferrous sulphate, a white precipitate of barium sulphate (permanent white) is thrown down, and ferrous nitrate remains in solution. Filtration serves to separate the precipitate from the ferrous nitrate solution, and this latter is supposed by some to yield pictures with purer whites than are obtained when the sulphate is employed.

M. Heston.—1. Strong alcohol will gradually remove nearly the whole of the water, leaving the films in a condition to be rapidly dried by the application of heat. 2. There is considerable diversity of opinion on this point, but our own experience is in favour of its direct application.

M. Walden.—You will find full details in the Year-Book.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1191.—*July* 1, 1881.

CONTENTS.

PAGE
Alcoholic Gelatine Emulsion ... 301
The Management of Light ... 301
Photography In and Out of the Studio ... 302
By-the-Bye—Pupil to a Photographer ... 303
French Correspondence. By Leon Vidal ... 304
Utilization of Thin Gelatine Plates. By Captain Abney 305
Notes ... 306
Topics of the Day—The Way to Preserve Negatives and Register Them ... 307
Club Sitters. By "Cliff" ... 308
Gelatine Emulsion-Making in Hot Weather. By Captain W. de W. Abney, R.E., F.R.S. ... 309
Improvement in the New Method of Manipulating Gelatino-Bromide. By Leon Warnerke ... 310
Correspondence ... 310
Proceedings of Societies ... 311
Talk in the Studio ... 312
To Correspondents ... 312

ALCOHOLIC GELATINE EMULSION.

The opponents of the gelatine process are fond of laying stress on the length of time which an ordinary gelatine plate takes to dry, as one of the greatest drawbacks to the successful working of the gelatino-bromide process; and it must be confessed that where the operator has only one dark room, he is much incommoded in all his other work while his plates are drying, and for this reason the preparation of gelatine emulsion with alcohol is a welcome improvement. Alcohol containing a small quantity of acid will dissolve gelatine copiously. For this purpose many acids (for example, aqua-regia) are available, and among the organic acids nearly all those in general use—acetic, formic, citric, malic, lactic, oxalic, succinic, &c.—will produce the desired effect. The question is, which of these acids should be chosen?

As organic acids, like aqua-regia (nitro-hydrochloric acid), are apt to reduce the sensitiveness of the silver bromide, it is better to have recourse to the organic acids, and among these the volatile acids are to be preferred to the fixed acids, since in drying they completely evaporate, and leave behind the pure film of gelatine. Hence we prefer a mixture of acetic acid with alcohol. Fabre, by his latest researches, has shown that only a very small proportion of acetic acid need be used with certain kinds of gelatine. Soft gelatine, like that of Nelson, will dissolve abundantly in a mixture of 100 parts of alcohol, and only 3 parts of acetic acid, while hard gelatines require 6 parts of the acid, and very hard gelatine, or isinglass, as much as 12 parts.

In such mixtures as these, dry gelatino-bromide of silver may be dissolved in the proportion of 10 parts to 100 parts of the solvent menstruum. If it does not readily dissolve, Laoureux recommends that the gelatino-bromide should be first soaked for some hours in water, and the water having been drained off, that the mixture of alcohol and acetic acid should be poured on. In this case, only a very small quantity of acetic acid need be added—a proportion of one per cent. will be sufficient. The mixture should be heated in the water bath to a temperature of 110° to 120° Fah.

When acetic acid is added in a larger proportion than that above given—say from 25 to 50 per cent.—the gelatine film is no longer firm, and sets occasionally with great difficulty. In order to increase the firmness of the film, collodion cotton (pyroxyline) may be added, and then we have Vogel's emulsion. Konarzewski obtained a similar preparation by dissolving one part of pyroxyline in 50 parts of alcohol and 50 parts of glacial acetic acid, and then adding 10 parts of dry gelatine emulsion. This collodio-gelatine emulsion sets and dries very quickly, and in respect of the various developers behaves very much the same as a simple collodion plate, for it bears an excess of silver nitrate better than does an aqueous gelatine emulsion, and it can be developed with acid, pyrogallol, and silver nitrate, only that in this case it is considerably less sensitive than with the ordinary alkaline development. According to Vogel, it requires with the acid developer an exposure of three times the length necessary for the alkaline developer to produce the same amount of detail, but much less vigour. Emulsions of this kind are apt to adhere badly to the glass plate; and the glasses should therefore receive a primary coating of caoutchouc solution, or of a dilute solution of gelatine in water containing some chrome-alum.

Wilde makes the following interesting observation. If gelatine, which has been soaked in water, treated with two or three times its weight of glacial acetic acid, diluted with alcohol, and then neutralised with ammonia, it will remain in a fluid state, notwithstanding that all free acid has been removed. Wilde has also introduced an emulsion of gelatine and resin; this he prepares by adding a solution of shellac in alcohol to an alcoholic emulsion of gelatine. An emulsion prepared in this way sets and dries more rapidly than an ordinary emulsion in which there is no resin, and its sensitiveness remains unaltered. Negatives taken with it have a somewhat milky turbidity by transmitted light, but this does not prevent them from giving good copies. The addition of the resin renders the film very firm, and facilitates retouching with the pencil.

Alcoholic emulsions of gelatine possess another advantage—they can be kept for months in the form of jelly without showing signs of decomposition. There would seem to be, therefore, considerable ground for further investigating these preparations.

THE MANAGEMENT OF LIGHT.

The characteristic differences which distinguish the work of various eminent portraitists are quite as much due to skilful and artistic lighting as to graceful and easy posing. Let us examine for a moment some of the best examples of artistic portraiture, and try to trace out the means by which excellence has been arrived at; and the result of this examination will probably lead us to the conclusion that a careful and appropriate management of the curtain and the reflector has been the prime mover in leading to artistic excellence. Who has not frequently been amused by contemplating the constrained and unnatural attitudes into which unfortunate victims have been worried by over-enthusiasts in the art of posing—photographers who appear to believe that every sitter must be arranged and fixed according to the same general principles? It certainly cannot be expected that a sitter should feel at his ease in a position altogether new to him, and in no respect similar to his attitudes of every-day life. In such a case, the look of restraint depicted on the countenance, and the general discomfort of the sitter, oftener serve to make the photograph a caricature than a portrait. To sum up with regard to posing for portraiture. The basis for work should be a natural position of the sitter, not an ideal of the photographer; and although this natural position may require modification, it should be allowed to hold good in the main. We need scarcely say that the above remarks apply to portraiture, rather than to figures or groups of a dramatic or ideal character, as in such cases the photographer's aim is to select and adapt his models to fulfil his own preconceived ends; but even when this is the case, he will often succeed better if he meets the idiosyncrasies of his subjects half-way, instead of adhering rigidly and firmly to his own notions.

As regards lighting, and the use of accessories, the case is very different, everything being in the hands of the photographer. He can place a small object—such as a basket of flowers, a vase, or a book—so as to balance what might otherwise be a notable peculiarity as regards the position of the sitter, or any want of symmetry in his figure; he may so adjust the light as to throw any notable point of elegance into high relief, to fairly illuminate deeply sunken eyes, or to cast a shadow on any sinister expression which may disfigure the face of the model.

It is a matter of considerable importance to possess abundant facilities for perfectly controlling the light, so that there may be no necessity to place the sitter in a fresh position and repose, in order to attain the requisite conditions of lighting; every change serving to weary the sitter, and considerably lessen the probability of a pleasing and satisfactory portrait being produced. This view of the case would naturally lead us to construct a studio so that light can enter from as many aspects as possible; means being provided for modifying or totally excluding any part or the whole of the light. Such a studio may involve more labour as regards actual manipulation of curtains and screens than would be the case with a glass house in which light can only enter from one side, or one side and the top; but the photographer who really takes pleasure in the production of the highest results will not object to this extra work.

As regards reflectors, nothing is superior to large sheets of white paper; these being either placed on the floor, attached to the walls, or supported on frames so constructed as to be capable of being inclined at any angle.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Reason of the Sensitiveness of Gelatine Plates—Testing the Nelson Developer—Blisters on Albumenized Paper—Increasing the Sensitiveness of Modern Dry Plates—Decomposition of Gelatine Emulsions—Influence of Acids on the Sensitiveness of Greenish Bromide of Silver.

The Reason of the Sensitiveness of Gelatine Plates.—As stated in our notes of June 12th, Mr. Warnerke is of opinion that it is not a chemical, but a purely mechanical reason, why particles of bromide are more sensitive in gelatine than in collodion. We have already doubted this suggestion in regard to the insensitiveness of silver bromide in a spongy film of wet collodion, and we will here give some illustrations. Dr. Vogel has proved that between the white bromide of silver in collodion emulsions, and the greenish bromide of gelatine emulsion, there is a very marked chemical difference; the first being much more quickly reduced by an alkaline pyrogallic solution than the second. This is not only the case with gelatine plates, but also with collodio-gelatine emulsion plates, in which the film is much more similar to collodion than to gelatine. Dr. Vogel observed that on two plates, one collodion, and the other gelatine, exposed the same time and developed simultaneously, the collodion plate developed much more quickly (see our issue of May 27, p. 242). Dr. Vogel has also proved that between a collodio-bromide of silver film and gelatine plates there is a very marked difference in the sensitiveness for spectrum colours. He exposed both kinds of plate to the solar spectrum, and observed that the collodio-bromide film is most sensitive to indigo rays (wave lengths 430) in the neighbourhood of G (Fraunhofer), whilst the gelatino-bromide film and the collodio-gelatine plates containing the greenish bromide of silver are most sensitive for the less refrangible blue rays (wave length 450). We think all the facts prove that between gelatine and collodion plates there is not only a mechanical difference, but also a chemical difference; that is, they contain different modifications of silver bromide. No doubt the character of the film has a certain influence; also if it is hardened in any way, the developer will penetrate it more slowly, and therefore its action will be modified. But there is still an optical influence of the film, which Dr. Vogel observed during his spectroscopical investigations. He exposed gelatine plates and collodio-gelatine plates equally to the solar spectrum and developed them, and in all cases he observed that the maximum of the action was in the same place (wave length 450), but that the collodio-gelatine plate was more sensitive to the lower refrangible rays than the gelatine plate, so that the sensitiveness of the former for the green rays was about the same as for the violet rays. Dr. Vogel therefore recommends the collodio-gelatine plate in general for taking spectrum photographs of the lower refrangible rays.

Testing the Nelson Developer.—It is well known that the ammonia solution of the Nelson developer (No. 2) is liable in hot weather to soon lose a notable proportion of its ammonia by evaporation. It therefore sometimes happens that gelatine plates of good quality give flat pictures which develop slowly. An experienced person would naturally add more ammonia to the solution; but others, not so well acquainted with the matter, might easily be led into difficulties. For determining the exact strength of the solution, Dr. Vogel recommends the following proceeding:—Dissolve six grains of oxalic acid (crystallized) in water, and dilute until the volume of the liquid is 90 cub. cents. Of this solution, which keeps very well, 5½ cub. cents. are necessary for neutralizing 1 cub. cent. of a normal Nelson developer (No. 2). For testing, take 1 cub. cent. in a measuring glass, put a small piece of litmus paper in it, add 4½ cub. cents. of the oxalic acid solution, and shake well. The reaction of the fluid should now be distinctly alkaline; if not, the developer is too weak for good work, though it may happen that for some kinds of gelatine plates it may still be useful. To continue the operation, more oxalic solution is added drop by drop till the litmus paper begins to remain red after shaking. If more than 5½ cub. cents. are necessary for neutralizing, the developer is too strong. If it is too weak, the quantity of ammonia which must be added to bring it up to the right strength is easily determined. Add to 1 cub. cent. of the No. 2 solution, 5½ cub. cents. of the oxalic acid solution, and afterwards, drop by drop, liquor ammonia till the red litmus paper, after well shaking, begins to remain blue. In this way the quantity of ammonia necessary for 1 cub. cent. of the solution No. 2 is determined.

Blisters on Albumenized Paper.—It being now summer, the old photographic difficulties caused by heat again demand attention. Everybody is familiar with blisters, and should know also the way of avoiding them. But it is certain that the use of a saturated solution of common salt after toning, or the application of four or six fixing baths of different strength, are not always successful. A German photographer now recommends us to put the prints, after toning, in a bath of alcohol (methylated spirit) 1 part, water 2 parts. The colour of the prints is somewhat changed by this bath, and they become a little transparent, but after fixing they look as usual.

Increasing the Sensitiveness of Modern Dry Plates.—A contributor of the *Mittheilungen*, Mr. Stosch, publishes some facts with regard to Dr. Vogel's notice on the action of nitrate of silver on collodio-gelatine plates (see our issue of

June 12, p. 282). Stosch has observed that the sensitiveness of gelatine plates can be increased by the use of nitrate of silver, there being no danger of red fog. He mixes 100 cub. cents. of alcohol with 2 cub. cents. of aqueous ammonia-nitrate of silver solution (12 grains nitrate, 250 grains water, 10 cub. cents. liquor ammonia). In this solution the gelatine plates are immersed for three minutes, and then dried, an operation which takes about five minutes. Such plates are, according to Stosch, three to five times more sensitive than without this treatment. Vogel has observed that the favourable action of the nitrate disappears after about one day, because the nitrate is gradually decomposed by the gelatine. But when the plate is to be used soon, this method certainly has its value. Stosch remarks, that by the nitrate of silver the sensitiveness only is increased, not the intensity; on the contrary, he observed that very dense gelatine plates when thus treated give thin pictures. The small quantity of nitrate causes no fog at all.

Decomposition of Gelatine Emulsions.—The same author speaks of the spontaneous decomposition of melted gelatine emulsion. He stated that with well-washed emulsions the bromide of silver was precipitated in such cases, and an acid smell was observed (this we presume to be due to acetic acid) from the decomposition of the gelatine. As a remedy, Stosch recommends the addition of 4 or 5 drops ammonia to 200 cub. cents. of emulsion.

Influence of Acids on the Sensitiveness of Greenish Bromide of Silver.—It is well known that free acids have a very considerable influence on the sensitiveness of wet plates; as they diminish it in a remarkable manner, not only in the case of bromo-iodized plates, but also in the case of wet bromide plates. On collodion dry plates, free acid seems to have also a retarding action; but on modern dry plates, free acid has no influence at all as regards the sensitiveness. In the gelatino-collodio emulsion invented by Vogel, a gelatine emulsion is dissolved in acetic acid, and diluted with collodion, and though there is more than fifty per cent. of free acid, the sensitiveness of the plates is the same as the sensitiveness of the original gelatine emulsion. Even more, this sensitiveness is observed not only after drying and evaporation of the acid, but also in the wet condition of the film.

By-the-Bye.

PUPIL TO A PHOTOGRAPHER.

We cut from our advertisement columns an announcement, of which there have been several examples lately: —"An active and intelligent Youth of 16, well educated, is desirous of entering a good Photographic Establishment, where he could learn the art thoroughly, and make himself generally useful."

The above and its fellows prove plainly enough two things: that photography has now attained to an attractive position, and that there is needed some systematic method of educating photographers. We know very well that studios of high rank are to be found where pupils are welcome, and where they have the advantage of a competent teacher in the technics of photography, as well as in the arrangement and lighting of the model. But no photographer, however competent, is likely to supply all that an aspirant requires to make him proficient in the art, any more than a Royal Academician, distinguished as he is, would be able in himself to train a painter. Fortunately, the teaching of a photographer and the teaching of a painter or draughtsman go upon the same lines in a great measure, and if a youth desires to become a photographer, and to achieve success in his calling, it is not only desirable that he should have artistic taste, but artistic knowledge. In a word, he should have both liking and ability. Many excellent art schools are now within reach of students of all classes, so there is no excuse for a young man now-a-days lacking the rudimentary principles of his calling.

It does not follow that a pupil entering a photographic studio does so with the intent to adopt the calling of a photographer. It may be with that object that he desires to familiarise himself with the art-science, and it may not. We have lately spoken with two gentlemen, both of them enjoying high rank as artists, who are extremely anxious that their sons should become masters of photography. But whether these young gentlemen remain photographers all their lives is a matter of secondary consideration; this will depend upon circumstances. They have both of them a taste for art, and desire to become artists; their parents are anxious, therefore, that they shall be in a position to produce pictures not only with pencil and brush, but with the camera also. In fact, it comes to this, that artists look at the camera as one means the more at their disposal. The camera has become so important a tool of late, that they cannot afford any longer to disregard it; therefore, they say, in future, not only must aspirants be taught to hold the pencil and ply the brush, but to develop a sensitive plate into the bargain.

Art students, no more than other people, can say at the outset of their career what their particular calling in life will be. One becomes a portrait painter, another occupies himself with water-colour sketches, and a third confines himself to the draughtsman's art. The first would be quite incapable, in all probability, of drawing upon wood a cartoon such as appears in *Punch*, or in our magazines, while the last, very likely, has never painted a portrait in oil that has been recognised by kith or kin. Each has adopted a particular line into which he has fallen, and makes what money and reputation he can in that branch. An art student, like the rest of us, tries his best with everything within his reach, with pencil and with brush, with oil pigments, water pigments, chalk, or black-lead pencil, and to those he will add in future the camera. He may in the end turn photographer, or he may not; he will just take up one art or the other, according as he excels, or circumstances dictate. Photography is not to be denied; it has forced itself upon the attention of artists, and those who would avail themselves of all means at their disposal must make a study of our art-science.

We are far from asserting that an artist only follows one branch of art; that would be absurd. But, as a rule, an artist derives his income from one particular line of art only. There are painters like Millais, who are famed both for portraits and landscapes; artists like Fildes and Fred Barnard, who ply both brush and pencil with equal success; but the majority work persistently in one groove. They are professional painters and dilettanti draughtsmen, or *vice-versa*; in other words, if they can draw well, they paint better. On the roll of photographers we have many excellent painters, who exhibit in the Royal Academy and other noted London galleries. Mr. H. P. Robinson, of Tunbridge Wells, earns probably as much by painting as by photography; the late M. Adam-Salomon, of Paris, skilful photographer as he proved himself, was not less a sculptor of the highest rank, as witness his work at the very last Royal Academy Exhibition; Herr Max Petsch, of the well-known firm of Loescher and Petsch, of Berlin, after oscillating for some years between the palette and collodion, now works only with the former; the late O. G. Rejlander worked alternately with the camera and with pigments, as he could best earn a guinea, a favourite saying of his being that photography in art was what steam was in navigation—you got to your destination so much faster; Mr. Robert Faulkner has a high reputation as an artist in crayon; Mr. Robert Slingsby, of Lincoln, has distinguished himself as a water-colour painter, and so has, we believe, Mr. Harvey Barton, of Bristol. We could, indeed, extend the list of capable painters and draughtsmen among photographers very considerably, if any purpose were to be served by such record, just as we might recite the names of many of our best painters who are either photographers, or make use of photography in their daily work. It is enough to show that the camera has now become a familiar tool among artists, and that photography is so intimately connected with artistic work that students must henceforth cultivate its acquaintance.

That many art students will eventually adopt the calling of photographer as their career in life is very certain. If an artist will thoroughly learn the technics of photography, not simply be capable of producing an image upon a glass plate, but able so to govern exposure and control development in the manner in which a Russell Manners Gordon can, then photography cannot fail to fascinate and attract as a fine art. The technics of photography are not more difficult to acquire than a knowledge of mixing pigments, and their mechanical application to canvas; but that the former requires to the full as much practice and experience is a fact beyond contradiction.

Nor can it be urged that the study of photography is unlike the study of pigments in the circumstance that some knowledge of chemistry is indispensable to the production of successful negatives. Painters have also to do with chemistry, and it would be well indeed for them if they devoted more attention still to science. There is a professor of chemistry attached to the Royal Academy at this moment, and has been for some years past, to instruct painters in the composition of the pigments they employ, to teach them how to secure permanence for their paintings and freedom from change of colour. It cannot be said, therefore, that photography is an art apart, for the reason that it is mixed up with chemical knowledge.

This circumstance brings us to a point that is probably the most important in the training of photographers. How are they to learn thoroughly the chemical rudiments of their art? As we have said, the practised photographer can teach the pupil much, but even if he had the opportunity, he has not the means to impart the necessary chemical education. Of late, it is true, there have been lectures upon photographic chemistry by able professors delivered in London, but we want something more than this. We want a technical photographic school, where the theoretical and the practical would join hands. No doubt, in time, we shall get something of the kind, and it is indeed matter for congratulation that we have, during the last twelvemonth, already secured so much. Perhaps one of these days there may be such an institution established upon the model of the Royal Academy, in which professors both of the art and science of photography will find a place.

The "At Home" next week will be "Mr. John Fergus at Largs;" the following "By-the-Bye" will be "On Taking-in the Editor."

FRENCH CORRESPONDENCE.

Mr. Warnerke's New Process—How to Improve the Ferrotype—A Short Review of Photographic Statistics—Actinic Difference of two Sources of Light having the same Illuminating Power.

Mr. Warnerke's New Process.—I owe a debt of gratitude to my excellent colleague and friend Mr. Warnerke, for the explanations which he has been good enough to make in his letter published in the Photographic News of the 17th of June last. These additional details throw great light upon the question; it is more especially valuable to learn that the selection of the proper kind of gelatine bears an important part in working this process. I have not had the time to make any new experiments on this point, taking into consideration the information which Mr. Warnerke has given us; but I thoroughly believe that anyone following the path which he has indicated, cannot fail of meeting with success. One conclusive circumstance alone, which I have met with without seeking for it, has verified completely Mr. Warnerke's allegations. While engaged in some researches, of which I shall have to say a word further on, as to the action of different sources of light of the same photometric power upon sensitive surfaces, I had been comparing the action of daylight with that of the light of a paraffine lamp. Some discs were taken of different degrees of opacity, corresponding to each impression. One of these plates, after being developed with pyrogallic acid, and not having been previously fixed, was left in a basin full of water, and some days afterwards, in shaking up the water in this basin, I saw the discs detach themselves from the surface of the sensitive film, which the water, though not heated, but still a little warm on account of the weather, had softened sufficiently to dissolve it. I at once saw that I had here a complete corroboration of Mr. Warnerke's discovery. It was perfectly evident that if this print had been transferred to paper, or to another plate, and treated with hot water, it would have been fixed merely by the gelatine, which had not been acted on by light, being dissolved, and without the addition of any acetic acid.

How to Improve Ferrotype.—The ferrotype process, which is so common in England at the present time, is also beginning to make its way in France; in Paris, especially, there is now a large number of persons working this process, who are able by means of it to make a very comfortable living, and who, unless they had adopted it, might have been asking themselves the question, whether it would not have been better for them to abandon photography as a means of livelihood. Now it is not unusual for them to take daily from eighty to a hundred and fifty francs, and this yields them a very handsome profit, considering that the cost of production of a dozen ferrotypes, which they sell for a franc, cannot be more than ten or twenty centimes. This is very good; but what is not so creditable is the inartistic quality of the work which they produce. This continued production of work of a miserable mediocrity has only the effect of bringing discredit on the photographic art; but I do not despair of seeing this manufacture of medallions more or less grey in tone greatly improved. As it is, the plates of iron which are used as supports are coated with a film of black or brown varnish, and to produce the effect wished for, it is necessary to have recourse to a dark substratum. It is to this unfortunate circumstance that these photographic toys owe their very small value. A great improvement would be effected if we could succeed in taking portraits by this process on a white ground. I have not myself tried it, but believe that this result could be arrived at by transforming directly the negatives into positives, by means of the process described in one of my recent letters. The iron plates, coated with a perfectly white varnish, should be collodionized with a rather thick emulsion of collodion, and, after a short exposure of a few seconds, they should be developed with iron sulphate. They should next be well washed, and then be submitted to the action of diffused light. Afterwards they should be plunged into a bath of potassium bichromate, of which I have already given the formula. The object of this bath is to dissolve the negative; the positive which is formed beneath the negative should then be developed, and the operation be completed in the ordinary way. By this means we should be able to obtain a charming positive on a white ground, one which artistically would be much superior to the ordinary ferrotype on a black ground. It is true the operation would be slightly longer than that of taking a ferrotype in the usual way. It would require five or six minutes more; but this increase in the length of time necessary for the production of the photograph would be largely compensated for by the much more satisfactory result. This idea I make a present of to my valued colleagues on the other side of the Channel.

A Short Review of Photographic Statistics.—I am at present engaged in drawing up the statistics of photography in France, to contain an account both of the persons engaged, and of the instruments and substances used in our art. This work, although it only can yield approximate results will be both long and difficult, and I am glad to be able to undertake it in concert with the *Chambre Syndicale de la Photographie.* It is stated, speaking in round numbers, that the sum annually turned over by the profession amounts to thirty millions of francs, and that there are twenty thousand persons engaged in it. These figures are no doubt a little elastic, and I believe that they should be rather reduced than extended. It is, in fact, very difficult to obtain any exact estimate; all that one can hope to do, is to arrive at some sort of approximation, which will be the closer in proportion as the numbers from which a start is made are correctly evaluated. However, there can be no doubt that, regarded as an industry, photography is capable of yielding considerable profit, and it seems to be generally very remunerative to the numerous employés engaged in it. A good operator in Paris will receive a salary of five hundred francs per month, and there are some who receive even more. An operator of any kind may reckon on being offered three hundred francs a month at least; there are very few who have less than that, except, perhaps, mere beginners, who are necessarily also incapables. The usual wages of a retoucher of negatives or prints is from two to three hundred francs a month, according to ability. Assistants get generally from three to five francs a day—women three, and men four or five francs. Printers, and those engaged in press work, earn different wages, varying with the kind of printing they are employed in; for albumen prints in the printing frame they are usually paid from two to three hundred francs a month. But for phototypie and Woodburytype a printer may get from five to ten francs, some even twelve francs a day, according to their ability. The operators employed in preparing plates for phototypie, and the gelatine plates for the Woodburytype, get no less than from four to five hundred francs a month. This abridged account shows that the photographic profession holds out very good prospects, and that a man who has merely a general knowledge of its principal operations is always certain of finding in it respectable, if not lucrative employment. There should be altogether in France about three thousand or three thousand five hundred photographic establishments of all kinds, at the head of which there are in all the principal centres, houses of considerable importance. I hope to be able to return to this subject when I have succeeded in collecting information sufficiently approximate to the truth.

Actinic Difference of Two Sources of Light possessing the same Illuminating Power.—It has been often shown that an artificial light, however it may be produced, is never equal in actinic effect to the light of the sun; but I do not know of any relation having been established between the actinic powers of various sources of light of equal illuminating power. With my selenium photometer—which I may say, in passing, acts with perfect regularity—I am able to obtain the same degree of illumination—that is to say, an equal deviation of the needle of the galvanometer with different sources of light. I should be, therefore, able to observe the effect produced upon a sensitive plate by different lights, regulated to the same photometric state: this is an experiment which I am at the present moment engaged in trying. The operation is an easy one to regulate; the selenium cell forming the receiver is moved about upon the table, and illuminated by diffused light, until the needle points to some fixed degree, 20°, for example. The receiver, which is thus acted on by light of a known illuminating power, is then removed, and its place is substituted by a camera provided with an instantaneous shutter, and containing a sensitive plate the plane of which is the same as that previously occupied by the cell. The trigger is then pulled, and an impression is taken; when this has been done, the daylight is stopped out, and a lamp or a ribbon of magnesium is lighted; in a word, any kind of artificial light is produced, and the selenium cell is again moved about, until it once more shows 20° on the galvanometer. The physical effect is, therefore, the same at this place, and an impression may be taken as in the first case; hence, using a lamp or a candle, a tint is obtained in the second case much lower in intensity to that obtained for the same photometric degree by the light of day. It is now easy to get at the relation which exists between the actinism and these two sources of light, and this is the investigation which I am now engaged in, to determine the intensity of the light of day, and of that of an artificial light producing the same tint; the difference between these intensities will show the relation. I use a spring-shutter, in order to have a constant duration of exposure for each experiment. The whole investigation is one of the greatest interest; but one it would not be easy to undertake without an instrument like my selenium photometer. Leon Vidal.

◆

UTILIZATION OF THIN GELATINE PLATES.

BY CAPTAIN ABNEY, R.E., F.R.S.*

What I am about to describe is not new; but it has scarcely been given sufficient prominence, I think, and it may be that it may aid in the utilization of thin gelatine plates which otherwise would be wasted. I have by me some gelatine plates which are very thinly coated—so thin, indeed, that when the image is developed right through to the back of the plate, the density is far less than it should be. It struck me that it was a pity to waste these plates, since they were exquisitely sensitive and bright, so long as the image was not forced in order to obtain density. The question arose as to whether sufficient density could be given before fixing; and the plates were so transparent that the density could be easily judged by transmitted light. Plates were exposed and developed with ferrous oxalate till an image, full of detail, could be seen by reflected light. The plate was then washed and plunged in the alum (potash alum) bath for a couple of minutes, and then washed under the tap. Ordinary pyrogallic and citric acid intensifying solution was then applied to the film, and allowed to soak in for half-a-minute, and then ten drops of a twenty-grain solution of silver nitrate to each ounce of intensifier added. The image came up rapidly and easily, without the slightest tendency to stain at any part, and perfect opacity could have been obtained without the slightest difficulty. The plate was then rinsed, and placed again in the alum bath, and then fixed in the usual manner. The negative was satisfactory in every particular, except in one which a very fastidious critic would have condemned. The gelatine had a very slight brown tone—not enough to interfere with the printing qualities, but still it was there, much less, indeed, than is seen with ordinary alkaline development. Another negative, treated with the iron intensifier, the formula for which I have often given in the Journal, was totally free from this tint, showing it to be a species of dye caused by the oxidation of the pyrogallic acid. Other negatives were developed with alkaline developer, and intensified in the same manner, and exhibited the same increased density of image. I think the emulsion in the alum bath an essential for success. I would treat an alkaline developed plate with pyrogallic in preference to an iron intensifier, and an iron developed negative with an iron intensifier. The reason will be apparent when it is considered what iron and pyrogallic acid might perchance form. I have not met with any stain due to this, but it is possible that it might occur.

Some of the plates experimented with were made of very soft gelatine, and it was curious to notice in some cases during intensification that the heat from the fingers caused the gelatine to run; but there were no blisters or frilling. When a dish was used, of course this disaster did not occur.

Local intensity can be given in this way with great success, and I exhibit a plate, one part of which has been intensified, and the rest left in its normal condition. It will be seen that the vigour of the one part is extreme, whilst the weakness of the other is very great. It would be interesting if others would try this plan and report. It might happen that certain gelatines were apt to stain, whilst others were free from the tendency. All I can say is, that all the gelatines used by me have behaved properly, intensity being given without any stain whatever, except that very slight one already mentioned.

---

* Read before the Photographic Society of Great Britain.

Notes.

Whenever you see a good pose, note it. Take heed how the hands are placed—how the head is poised—how the figure is turned. Portrait and character painters are for ever looking round for unconventional studies in the streets, in the squares, in the parks—indoors, and out of doors. There is a pretty pose in the frontispiece of William Black's new story, "That Beautiful Wretch," that will suggest much to the portrait photographer.

MM. Benque et Cie, of Paris, have sent us a dozen charming pictures of Madame Nilsson, taken on the day we were "At Home" at their establishment. Though the portraits are particularly bright and happy, it is not of them we wish to say a word, but of the natty little box of white glazed cardboard, edged with gold, which contained them, the cards being lifted from the box by a dainty satin ribbon, fixed in the same way as in a medal case. This tasteful box is probably an inexpensive affair when purchased in numbers; but adds much to the *tout ensemble* when the portraits are sent home.

The inventor of the bicycle—Mr. James Stanley—died at Coventry last week. Few photographers are aware how intimately the old velocipede and the history of photography are connected; but, strange to say, while Nicephore Niepce, in 1816, was working at his camera at St. Loup, his brother Claude was in London—at Kew—trying to sell a novel perambulating machine, the invention of the two brothers. England was supposed to be the best market for inventions, so to England brother Claude was despatched; and the earliest records of Nicephore's photographic researches are contained in letters to his brother in this country. Without Claude had visited England, there would have been no correspondence; and without the correspondence, there would have been no history of the first camera pictures ever taken.

An electric lamp for eighteen stamps! Verily, we seem to be approaching the era of cheap and perfect lighting. And the best of it is, the Yankee invention—for it comes to us from America—is everything it purports to be. When you open the box there are the two carbon terminals and all the proper connections. Indeed, the arrangement is perfect; all you want is a Gramme machine, say, for generating electricity, and perhaps a small steam engine to set this going. The lamp, on the whole, therefore, is a little unsatisfactory, like "The Way to Exterminate the Colorado Beetle," which you were asked to purchase some time ago for a couple of dollars; here, in return for your money, you received the advice to select two stones, a round and flat one; then, having caught your beetle, it was to be held firmly between thumb and forefinger upon the flat stone, while you smashed it with the round one.

Dr. Vogel writes from Berlin that he has just sent a first supply of his collodio-gelatine emulsion to Messrs. Rouch and Co.

Two new names in the photographic world. We read in an American contemporary—the *Practical Photographer*—of some interesting researches in development very similar to those of our friend Dr. Eder, which have been undertaken by a gentleman who signs himself "J. M. Edgar, M.D.," and who seems, like Dr. Eder, to have first communicated his work to the *Correspondenz*. The Paris *Revue*, which ought to be well informed on all matters Parisian, recently announced the death of M. Abraham Solomon.

The catalogue which the Queen is preparing of all presents made to Her Majesty during her reign, and which is illustrated by photographs taken by Mr. Jabez Hughes, of most of the objects, is to be for private circulation only. The photographic prints are not in silver, but in carbon, and hence the volume will long retain the interest that naturally attaches to a work which recalls many striking incidents of the Victorian epoch. The humble gifts of carved box and needle case, as well as the more gorgeous presents of jewelled caskets from India and costly porcelain from Sèvres and Dresden, are alike represented.

Last week a fire occurred at the Leicester Square Panorama, through incandescent carbon falling from one of the electric lamps upon some straw. This is not an unusual thing with the ordinary electric lamp; not six months ago, when "At Home" in an electricity-lit studio, we were witness to a shower of red-hot carbon, which fell from the lamp within a few feet of the sitter's muslin dress. We must not suppose, therefore, that electricity gets over the dangers of conflagration.

Messrs. Harvey, Reynolds, and Co., of Leeds, send us an ebonite shutter which, at first sight, appeared to be made on the plan of the old-fashioned single-flap shutter, where a flap is hinged at the top, and a milled head, attached to the hinge-pin, serves to raise or lower this flap. In the case of the new shutter, any motion of the flap, beyond what is necessary for uncovering the lens, liberates a drop-shutter, which serves to instantaneously terminate the exposure.

This very compact and well-constructed apparatus serves well for long exposures, which can be terminated at any instant; or, if the flap be quickly opened to nearly its full extent, the drop comes into operation at once, and an exposure of a fraction of a second is the result.

The same firm also sends us a travelling lamp in which the windows are formed of sheets of horn stained with aurine.

Coffee'd cotton will be found most effective for draping models for the camera; moreover, coffee is a dye that is easily obtained. The other day we saw some delightful pictures, taken out of doors, of a young girl whose lighter garments were rendered with exquisite softness and detail, the garments being a handkerchief worn across the chest, and an apron of white cotton just tinged by dipping in a solution of weak coffee.

There is hot competition in science, as in everything else, now-a-days. The *Times* received "hundreds of letters" the first day of the comet's appearance, all acquainting the editor with the fact that the writers had duly observed, examined, compared, measured, spectroscoped, and weighed the new arrival. Only one contributor, however, was fortunate enough to get his name printed, and be told how he had examined the comet between one and two in the morning; and, marvellous to relate, it was very bright, and showed a continuous spectrum. We also observed the comet on Friday night; but then we couldn't help ourselves, for its broad, luminous body happened to be the only object before us.

We shall have to write a series of "At Homes" among amateurs, if we are to make our task anything like complete. We had the pleasure, last week, of visiting the studio of Mr. Noel Fitch, one of the earliest and most successful of our amateurs, and found not only a very perfect establishment, but certain clever and original arrangements, of which we shall not fail to speak at an early moment.

In connection with the Royal Academy and the Paris *Salon*, there have been issued during the past few years catalogues containing "thumb-nail" sketches of the principal pictures. The sketches are more or less perfect, and, as most of us know, they are generally photo-types from original drawings by the painters themselves. But how do the painters manage the drawings? Whether they are quick or slow with the pencil, it is always a work of some little difficulty to sketch the salient points of a big picture within the compass of a few inches, and anyone who has carefully looked through "Academy Notes," or the *Salon* catalogue, knows that most of the sketches, if they give but a few traits of the painting, convey correct proportion, and show all the marked characteristics.

Topics of the Day.

THE WAY TO PRESERVE NEGATIVES AND REGISTER THEM.

BY JOHN HARMER.

Supposing the negative to have been secured on suitable glass, its principal enemies are dirt and damp; sudden change of temperature contributing towards the production of the latter, and otherwise assisting it in its work of destruction, so speedily effected, especially when the glass is of a soft description, or liable to sweat. These facts point to the necessity for the exercise of much consideration and care in the selection of a place for storage. If the wall-space of a whole room can be spared for this purpose, having its position as nearly as possible in the centre of the building, the chances of spoiling from the above cause will be reduced to a minimum; but in the event of so desirable a spot being unobtainable, only party walls of any other room should be shelved or pigeon-holed for the reception of negatives, the outside ones of most buildings being always more or less moist when any structure is reared against them, unless provision is made for thorough ventilation. The wall-space, having been selected, should be strongly shelved, with the strength of brackets or other supports increasing downwards from the ceiling to within a foot or so of the floor, the distance between the shelves being about half-an-inch wider than the negatives for which they are intended, and their width equal to their longest dimensions. To give additional strength and stability, they should be partitioned into about two-feet lengths, by the insertion of upright pieces of wood between them and the whole, and shelves and divisions arranged to leave an interval of half-an-inch or so between their edges and the wall for the free circulation of air. For large negatives, as whole plates, 10 by 8, and so forth, the shelves may be constructed as gratings by nailing strips of wood about an inch by three-quarters edgewise on framed uprights. The above details of construction include all that is essential for the disposal of all negatives in a neat and orderly manner. A few shelves with grooves, and lettered with the alphabet, will be found very useful for the temporary storage of negatives which have not been ordered from, or only at the stage of having had proofs printed from them.

The negatives, as they come out of print, should be sorted into pairs, placed back to back, and be simply and neatly wrapped in a piece of close-textured paper; these small packages to be again sorted and parcelled up in brown paper, in tens if various, or more if of one subject; but this I will revert to again and explain more exhaustively when the second part—treating of registration—is discussed. Negatives secured in this manner have an additional safeguard against moisture and other sources of injury, and, when placed on the shelves in consecutive order in respect of their numbering, appear tidy, and are readily accessible. My own experience supplies me with an instance of the advantages of wrapping thus, for I recollect about 4,000 or 5,000 negatives being stored a few feet from an outer door which was made use of by the printer daily—in fact, nearly always open, winter and summer—yet I do not recollect a single one being found which exhibited the effect of such an exposure. I may add that all were passed through my hand prior to being printed from.

The following is the method of registration; I have found it most simple and efficient in all circumstances. Each new sitter receives a number at the time of sitting, which is marked, together with the name, upon each negative, thus:—

Jones, Mrs., 47.

The results of any re-sit or after-sitting by the same party are marked, and placed, with the same number, all after the first having the year noted, to indicate the time of production. The plates, as they come out of print, have these details entered in a lettered index book under the letter corresponding with initial of the surname, the size of the plate, if other than carte, being written against the other particulars. Animals, copies, and such like are marked and entered in the name of the party giving the commission, the entries of the above respectively appearing thus:—

Jones, Mrs., 47.
Jones, Mr., 48, cabinet.
Jones, Mr. (Dog), 49.
Robinson, Mr. (Copy), 50.
Rawlings, Mr. (10 by 8), 69.

This operation complete, they are wrapped up in pairs when there are more than one of the same individual, and piled in heaps of a dozen or so. At the end of the week, or more convenient period, these are arranged with the numbers in consecutive order, and are then taken and parcelled, about ten together, in brown paper, the ends of the package being branded with the lowest number of its contents, and placed away on the shelves in the same order.

Landscape negatives, groups, and all coming under the head of out-door photography and odd work, are treated in exactly the same way; a single negative or a series of one subject, having only one number allotted, for convenience; one of another set to keep this branch distinct from that of portraiture; these being registered, parcelled, and stowed away on the shelf suiting size in accordance with it. The necessary details in this department are registered thus:—

Albion House, 10 (12 by 10.)
Amery, W. (Group, 10 by 8), 15.
Brown, W. (Horse, whole-plate), 20.
Brighton Pier (10 by 8), 25.
Pier Brighton (10 by 8), 25.

The double entry is made where many taken in the same place are likely to appear together and create confusion.

If this system be properly carried out by making use of the name as well as the number, there is no hunting for a negative; its place is known to a certainty—either the one or the other being given. The former, however, is that which the client is generally able to furnish, for the other, if the rather objectionable practice of marking the card has been resorted to, is not remembered, or, perhaps, was never noticed. The whole business consists in a reference to the register, and a journey to the shelf for the package.

BY B. RHODES.

The importance of preserving negatives is such an acknowledged fact, that any comment on that point would be quite superfluous; therefore, without waste of time or words, I will at once point out a method which I have adopted, and recommend as being easy, economical, expeditious, and effectual (mark the four E's, not F's). After the negative has been varnished and retouched, previous to its going into the hands of the printer, paste a sheet of smooth thick paper on the back of the glass, as near the top as possible, so that when the negative is not in use (printing), the paper can be doubled over the top edge, which covers the entire film, and protects it from scratches.

In placing the negatives on one side (after present orders are executed), pending their final removal to the "storeroom," carefully, with a soft brush, remove all dust and grit, double down the paper as before mentioned over the film, and place them front to back. Comply with these instructions, then a scratched negative would prove the exception, and the labour of the spotter be reduced to a minimum. For "storing" negatives, grooved boxes are the best in every respect—they are a perfect security against breakage and damp. A good substitute for boxes is a rack with numerous partitions, erected in the centre of a room where a current of air could pass through, and the negatives placed in batches according to their alphabetical order.

Registering Negatives.

Nothing is more galling and vexatious, besides being a great loss of time and money, if negatives cannot be found when applications are made for back-orders. This is the result of a lax and careless manner of keeping—or, rather, of not keeping—them in proper order. Try the subjoined simple and concise form of—

Order and Reference Book, 1881.

POSITIONS.

No.	Name and Address.	Full-Length.	Half Length.	Three-Quarter.	Bust.	Size.	Date.
1	Abell, Jas., Mrs.	...	...	1	...	C D.V.	May 29.
	Burlington Terr.	...	1	...	1	Cabinet.	,,
	Brighton.	1	...	...	...	Promenade	June 1.

From the above you will see Mrs. Abell was photographed in four positions, one C.D.V., two cabinets, and one promenade. Any other styles could be entered in the same manner. As soon as the negative is varnished, write on it with a sharp-pointed penknife, or other suitable instrument, the number, name, and date, as: No. 1, Mrs. Abell, May 1881, or any part of the negative where it will not interfere with the print. This is permanent. Ink in time rubs off, and gummed paper is liable to detach itself, owing to atmospheric variations. Now write the same in ink on the piece of paper attached to the negative, so that when wanted it can be found at once, after referring to the Order Book.

Each sized negative should be kept distinct, but if a sitter is taken in various sizes, all should be registered under one number.

If to be packed in boxes, fill them; if in racks, pack them in compact parcels of about two dozen, alphabetically and numerically arranged. All "stock" negatives to be replaced once every week, which will save a tremendous lot of time and trouble, and keep the printing room orderly. If the above method is adopted, it will be a pleasure to receive orders and execute them, as no bother whatever will be experienced in finding negatives when wanted, and, when found, they will be in a good state of preservation.

The "Topic" next week will be "On Vignettes," by George Bradforde.

COMMISSIONERS OF PATENTS

CLUB SITTERS.—No. 1.

BY "CLIFF."

Some two years ago I was the proprietor of what Mr. Bradforde would call a "nice quiet little business," situate some sixty or seventy miles from the metropolis. Unfortunately for me, it was a great deal *too* "little," and a great deal *too* "quiet." One moderately fine morning in April, I was wondering whether it would be of any use to get my lenses down from the bedroom, where they always remained at night—and alas! often by day too—when there came a vigorous pull at the studio bell. My spirits rose with the sound, and visions floated before my eyes of sitters for cabinets, promenades, or even twelve by tens, and visions better still of the bright yellow metal which was to recompense me for the same.

My wife answered the bell, and broke in upon my aerial castles by exclaiming, "Oh! Cliff, dear, here's a gentleman come to see you; I don't think he's a sitter, he looks more like a traveller." My visions changed, and instead of seeing yellow metal, methought I heard some such words as these: "I have been asked by Messrs. Jinglum and Twitch to call upon you for an overdue account, and to intimate that unless the same is immediately settled," &c., &c., &c.

However, I arose, and entered the reception room, to find a young man of decidedly prepossessing appearance comfortably installed in a chair, and leisurely examining the portraits in the specimen album. On seeing me he at once jumped up and grasped my hand in a most cordial and friendly manner; I was somewhat surprised at this ebullition, for I could not remember ever having seen him before.

"My dear Mr. Cliff," said he, "allow me to introduce myself. I am the representative (I shuddered) of Messrs. Jones and Co., the great photographers (I breathed again) of London, Liverpool, Manchester, New York, Boston, Honolulu, Melbourne, Yokohama, Timbuctoo, &c., &c., &c., and we have been of late starting portrait clubs all over the country. Where we have no establishment of our own, we commission a local portraitist to take the negative, supply twelve cartes therefrom, and lend it to us to make our enlargement, and for this we give a fair recompense. We have been specially recommended to you for this town, where we are about starting our clubs, and if you will take the matter in hand we can promise you an average of two sitters a day from our clubs, and will pay you six-and-sixpence for each one you take. The class of persons going in for club portraits are not the class from which your business is derived, so that no injury can accrue to it from the formation of our clubs.

Now, here was a godsend—or, at any rate, that is how it struck me then; business was quiet, very quiet, and an additional four or five pounds a week would be a boon. Need I say I looked upon Mr. Slithery, Messrs. Jones's representative, as a true friend, and almost as an angel in disguise, and at once closed with the offer. We adjourned to my snuggery, in the garden; I produced a bottle of old port, such as I only drink on high days and holidays, and over that port and some fine cigars of Slithery's, we discussed the details of our little scheme, and once more visions of the bright yellow metal rose before my eyes.

After spending about half-an-hour in this manner, the studio bell again rang, and I was called away to attend upon a "real live sitter." Before retiring to the studio I shook hands with Slithery, who said he would be off and hunt up an agent or two, and call in during the evening. Hastily swallowing some half-dozen cachious, to take off the aroma of this (for me) unprecedented dissipation, I prepared myself for work, got some good negatives of the sitter, and before she was gone had another waiting for me, and, strange to say, was busily engaged in the studio until four o'clock, when I managed to get something to eat; but directly I had swallowed a few mouthfuls, in came more sitters. Six! six! thought I; luck is going to take a turn at last, and good things, like evil, seem to come together. About six o'clock, however, the sitters stopped short, and I was enabled to have a comfortable tea, and a chat with my better half over what we were already commencing to think the commencement of brighter days. Our work for this day amounted to just £5 11s. 6d., which had hitherto been almost as much as we took in a week. Many and intricate were the calculations we entered into as to the probable amount of business the summer months would bring us. After tea, in came Slithery, and informed me that he had already appointed three agents whom I might expect to sit for their portraits, which Jones and Co. gave them gratis as specimens, in the course of a day or so. We had some more cigars and some more wine, and altogether I spent a most pleasant evening, and when I retired to rest it was to dream that I had branch businesses all over the country, employing about 300 assistants, and turning over my money in splendid style. The sleep of my wife had apparently been as pleasantly troubled (if I may use the term) as my own, for she told me at the breakfast table that she had dreamt I was appointed to photograph all the members of *all* Jones's clubs. On this day I was almost as busy as on the one before, and in addition to my ordinary sitters had the pleasure (?) of taking agent No. 1. He was a local frame-maker, and rather a good-looking chap, only the worst of it was he had never been photographed before, and seemed to think it a most dreadful sensation; at any rate, he moved eight times before I got him. He then wanted to know when he was likely to have his enlargement. I replied that I could not say for certain, but thought in about a week. I put that negative in hand at once, had it varnished, retouched, and proof printed, and the next morning it was sent home for his inspection. About ten minutes afterwards a boy came in to say his father liked his portrait very much, and he was to take the other eleven copies back with him. I explained—or, rather, tried to explain—that photographs were not produced by machinery, that they had to be printed, cut, toned, fixed, washed, mounted, spotted, and varnished. The boy stood with his mouth open while I explained, and I rather question whether he was wiser when I finished than when I begun. I also told him that as the enlargement was the most important, I intended sending the negative up for that to be made before I printed the cards, so that he must not expect those for about ten days or a fortnight. By the next post negative No. 1 was on its way to Messrs. Jones and Co.

In the course of the day, two more of the agents came to sit; they did not give me so much trouble as the first, but one of them was very much disappointed that he was taken with the ordinary apparatus in an ordinary studio lighted with the rays of the sun, instead of by the then new lightning process, which he had read in the "Daily Crammer" was now used in all studios in preference to daylight. I told him that the so-called "lightning process" was only a name; that the same light and the same apparatus were used, but that the plates were more rapid. I further added that I had a supply of these same plates on order, and expected them in a few days. He then asked, "What would I charge him for half a dozen cartes taken with them, just to say I have been taken by lightning, you know." I told him my price, and he agreed to come that day week. That evening, Slithery looked in again to say he had appointed twelve agents in the town and vicinity, and was off again for a town some twenty miles away. Before he left, however, I asked him, "How about re-sits?" "Well," said he, "what do you do with your ordinary sitters if they want to be taken again?" "Charge them half-a-crown," replied I. "Very well," was his reply, "do the same with the club sitters." A few days after my fourth club sitter came in, and when I looked upon him, didn't I just pity the retoucher? He was a beautiful specimen of the angular youth, tall and gawky. His complexion was what some would call fair, but *I* don't think it at all "fair" to the really "fair" to give it that name, for *his* face looked as though it had originally been intended for a plum-pudding, which had first got thrown against a wall, and then in some peculiar manner become invested with life, the plums and currants turning into freckles, and the other part very small in comparison to the plums and currants, while becoming flesh retained its doughy appearance. His eyebrows were white, his hair and whiskers of a red, intense enough to shame any full-blown beet; he was for a specimen. What remarks were made in the sacred precincts of the dark-room I will not here divulge, but merely remark that it was lucky for Slithery that he was absent. I spent the best part of my day in trying to find a suitable lighting and position for the specimen, and at last succeeded in getting a good negative. My retoucher, after spending two hours' labour on that face, and finding it wanted as much more, remarked that it was a pity that "our specimen" had not gone a month before to seek a glorious name in Zulu Land.

The negative was finished at last, and the resulting print was the portrait of a man with somewhat angular features, and in some distant way reminding you of the original; about the kind of thing that an enterprising photographer advertises as having a strong family likeness. "Our specimen" was delighted with it himself, and offered to give me as many sittings as I liked for specimens for myself in promenades or direct 18 by 15 heads. I declined the favour owing to "press of business."

◆

GELATINE EMULSION-MAKING IN HOT WEATHER.

BY W. DE W. ABNEY, R.E., F.R.S.

I have thought it might not be amiss to describe the plan I have been following in making emulsion during the last hot weather we had. In my plate-making room the temperature was often at 85°; but, nevertheless, several batches of plates were successfully prepared. The method adopted is very similar to that I described in my little book, "The Practical Working of the Gelatine Process;" but there are one or two alterations in procedure. In the first place, I use the formula which was described in last Journal, using potassium bromide instead of ammonium. It is as follows:—

Potassium bromide	250 grains
Nelson's No. 1 gelatine	45 ,,
Water	1 ounce
Strong hydrochloric acid	2 drops

This is prepared in the usual way, and warmed up to 120° F., and the following added in the usual way:—

Silver nitrate	300 grains
Water	3½ ounces

Finally, this next solution is added—

Potassium iodide	12 grains
Water	1 drachm

This I mix in a long hock bottle, shaking between each addition. This is transferred to a glass flask and boiled for half-an-hour, shaking up the emulsion at intervals. This is allowed to cool in the flask for half-an-hour, when to it is added, with shaking—

Nelson's No. 1 gelatine	120 grains
Coignet's gelatine (new brand) ...	120 ,,
Water	3 ounces

After soaking, and very slightly heating to melt it, about three drops of strong ammonia in half a drachm of water are then stirred in, and the emulsion is poured out into a jam-pot, which is immediately placed in iced water, a few lumps of ice floating in it. In half-an-hour the gelatine will be firmly set. The jam-pot is then dipped for a few seconds into boiling water, which will loosen the gelatine from its sides, and the lump of emulsion is transferred into moist canvas, and squeezed through into a jar of iced water (the water having been run through filter-paper to get rid of all floating matter), in which a few small lumps of washed ice are floating. After ten minutes the water is changed, and after another ten minutes is changed again, when it is again collected in the canvas and squeezed through into water. One more change of water should be sufficient to free it from all except traces of soluble salts. It is then transferred to the canvas and allowed to drain over a jar half-an-hour to three-quarters.

It is again transferred to the jam-pot and melted, and a slight trace of carbolic acid (or other antiseptic) added, and then once more placed in iced water. In half-an-hour it is set, when it is covered with alcohol and allowed to ripen for a day; and if the jar is placed in water containing a lump of ice, so much the better. When plates have to be coated, the slab on which the plates have to be set is covered with small lumps of ice for half-an-hour, and if it be thick it is only very gradually cooled; but, on the other hand, it also only very gradually gets warmed again. During this time the emulsion is melted, six drachms of alcohol added, and filtered. When the plates are coated (after the slab has been dried from all water), it will be found that the film of the emulsion will set in a couple of minutes, and that the slab remains cool enough to enable five or six batches of plates, filling the slab, to be prepared; that is, supposing your slab to hold eight plates, you can coat forty to forty-eight without re-cooling the slab. I find that the gas of the drying-box may be lighted immediately, and the drying of the plates will proceed rapidly, and not re-melt. If gelatine be once well set, it requires a high temperature to re-melt it; and the more the water is evaporated, the higher the temperature required. As the current of warmed air passes over the plates the moisture is rapidly absorbed, and hence the drying can be effected with safety.

My excuse for writing this must be the fact that I have had many letters, asking how I prepare emulsion in this weather; and I trust that this description may be taken as an answer to them. Doubtless there are other modes which will succeed as well; but I think, for an amateur, this plan will be found to be everything that is required. I would just say, that supposing by any chance the emulsion appears too thin before coating the plates, 40 grains of Coignet's gelatine may be melted in three drachms of water and added to the emulsion, with much stirring, immediately before filtering.—*Photographic Journal.*

IMPROVEMENT IN THE NEW METHOD OF MANIPULATING GELATINO-BROMIDE;

And Experiment relative to the Cause of Sensitiveness of Gelatine Emulsion.

BY LEON WARNERKE.*

At the last meeting of this Society, I described a new process. It will be remembered that in this process a sheet of paper is covered with gelatine emulsion, exposed in the camera, developed with pyrogallol, and then cemented to the glass or other impermeable support; and by treatment with hot water, from the side opposite to that exposed to the light, the image is obtained; but this image is reversed, and, if required for silver printing, it could not be used without double transfer. Since that time I have succeeded in doing away with the necessity for double transfer, by the following method:—After the sheet of gelatine-emulsion tissue is exposed and developed with pyrogallol, a glass plate is rubbed with talc (French chalk) and covered with plain collodion. When the collodion is set, but before drying, it is immersed in cold water, and left until all greasiness disappears. The developed image is then put in contact with collodionized glass, all excess of water removed with an india-rubber squegee, and the glass is left to rest for about ten minutes. It is next immersed in warm water, the paper which was used as the support of the tissue is peeled off, and all soluble gelatine removed by washing. Next, a sheet of gelatine, similar to that used by engravers for tracing, is immersed in cold water until softened, and, by means of the squegee, cemented to the previously dried image. When this is dry, which takes place in the present season (June) in about two to four hours, it is easily peeled off, and in this condition it presents a flat sheet of gelatine, with the image permanently fixed. In order to render it proof against every possible accident that can occur during the printing, it is advisable to give a coating of collodion before the gelatine sheet is peeled off. Prepared in this way, a film negative being protected from both sides with collodion, it cannot be injured with damp, so that it may be washed with sponge or immersed in water for a short time. It can be printed from both sides, and it will be seen by the specimens sent round for inspection that the thickness of gelatine does not affect the sharpness in printing. It is useless to dwell upon the utility of having negatives upon the film rather than on glass.

Since my last communication regarding gelatine emulsion, several persons have tried the system, and some have complained that the developed image is rendered totally insoluble by the action of pyrogallol, or that the surface-film remains insoluble. This will always be found to be the case when gelatine emulsion is rendered insoluble by the addition of alum, or other treatment, during its preparation; therefore that kind of emulsion must be used which produces a film soluble in warm water. I found, however, that, even in the case of insolubility, the addition of acetic acid, and using the water warmer, are a great help.

I should like to communicate a phenomenon observed by myself, which may help towards the explanation of the cause of the sensibility of silver bromide. I found that if the surface of a gelatine emulsion plate—glass or paper—is pressed, those parts which are subjected to pressure are rendered less sensitive; this is made evident in the development. At first I thought that the pressed parts are not so easily acted upon by the developer; but the following experiment cleared up my doubts. I wrote on a sensitive plate some words with an ivory stylus—not scratched—then exposed it to light, and I wrote again after exposure in a similar manner: in the development the words written before the exposure appeared light on a dark ground, and very distinct; those written after the exposure, either were not visible at all, or appeared darker than the rest of the plate: and this experiment was tried many times. Reasoning that if the compression of the film diminishes the sensitiveness, the reverse action must have the effect of increasing it, I moistened with water the film before exposure, and the result gave the proof of my supposition.

The approaching summer recess, and my own intended absence from England, decided me to hasten the communication of this isolated observation, in order to contribute data showing that the previously expressed opinion by Captain Abney is strictly correct, viz., that the superior sensitiveness of bromide of silver in gelatine is not due to any difference in its chemical composition, but solely to the difference in its molecular conditions as compared with collodion emulsion. It is also evident that it will not be safe to rub or otherwise press the sensitive surface. In the experiments described I found that a very slight pressure produced a visible effect: in fact, my first observation was made on the sheet of tissue at the back of which a number was written in pencil.

Correspondence.

WORK AND WAGES.

Dear Sir,—Both your "By-the-Bye," and the letter from "A Printer," on the topic of "Work and Wages," are, I think, very discouraging to young printers, and somewhat unnecessarily so. If, indeed, matters are so bad as represented, I think we had all better seek some other employment, for there are other classes of work requiring less labour and skill, for which better wages are paid.

I am inclined to think, however, that things are not quite so bad, although I have only been in the profession the same time as "A Printer." I have for the past eighteen months received a considerably higher salary than the one he mentions, and I have known a printer and toner who received a weekly salary of £2 10s., and also an assistant printer, who did very little actual printing, who received 30s. per week.

---

* Read before the Photographic Society of Great Britain.

In conclusion, I would suggest that the desirability of a Saturday half-holiday for photographers' assistants should be discussed in connection with work and wages. Surely few need a half-day's recreation more than those who work in the dark room! Hoping we shall still have some spirited discussion on this topic,—I am, yours truly,

Young Excelsior.

Dear Sir,—Permit me to say, in reply to "H. J." of last week, that for retouching, I consider a fair day's work from eight carte vignettes to one dozen, and if cabinet heads, from four to six; of course, retouching and retouching differs so now-a-day.—Yours truly, Retoucher.

GELATINO-BROMIDE AT A DISCOUNT.

Dear Sir,—Will you permit me, through your valuable journal, to thank you for the kind insertion of my letter, and also those gentlemen who have taken any interest in my troubles. I would desire especially to thank Mr. Pumphrey for his letter, in which he correctly stated the cause of my failure: too much gelatine—too much chrome alum—too thick coating. These are, I believe, the causes of the defect I have suffered so much from. I am pleased to say that I can now make beautiful plates by any of the methods I before tried, and failed with. I hope before long to have an opportunity of thanking Mr. Pumphrey personally for his kindness.—Yours truly, Thick Head.

Dear Sir,—Seeing a letter in the Photographic News signed "Thick Head," allow me to say that I sympathise with him; mine is a similar case. After carefully going through the various manipulations, and giving the best attention, and trying for many months, I must confess that I cannot make decent gelatine plates. I can proceed quite well with the wet process, and can develop and use most of the dry plates in the market, but cannot make batches of emulsion that have any uniformity. I need not say anything about the vexation, disappointment, and loss; but this I will say, I think it would pay any one who is *au fait* at the preparation of gelatine plates to make a tour of the provinces. From what I know of the success of photographers in this town in their attempts to prepare their own plates, I think he would be received with open arms.—I am, sir, yours respectfully,

Another Thick Head.

THE GALTON COMPOSITE PORTRAITS.

Sir.—In your notice of the "Galton Composites," your suggestion, though written in a vein of pleasantry, relative to the employment of a subsidiary and underlying type of feminine beauty in the production of portraits of lady-sitters, is one that is entitled to a share of respectful attention.

The result at which you more immediately pointed was that of producing a correct, but, at the same time, a flattering portrait.

Permit me to add, that, when this sort of thing is skilfully carried into effect, there will be found to accrue a further and noteworthy peculiarity, bearing some resemblance to the statuesque illusion of the stereoscope, or, at any rate, to that of medallion portraiture, and adding much to the realism of the photograph.

The "zero-line" of the pupils, by means of which the superposing is effected, claims, of course, much nicety in its accurate production. In photographs of life-size, however, a scrupulous accuracy can be effectually secured by a geometric method, especially adapted to the conditions; not that the lines of superposition need be really visible upon the portrait, but only on the margins of the several negatives. Neither is there need of the subsidiary zero-line which, in the method of Professor Galton, crosses at the mouth. For, in truth, unless the type and the antitype so nearly approximate that the distance from pupil to pupil serves as the only required guage, the result will certainly not be satisfactory—albeit that only the "points in common" are presumed to be visible. Even the differing length of noses, for example, becomes a most obtrusive tell-tale, and upon occasion might originate an appearance for which the term "disagreeable" would be rather mild.

In the production of a Galton group, it must be conceded, therefore, that so diversified are the faces of men, that, if it were not for the use made of the sub-zero-line, the longer-visaged components of the composite would indubitably transmit the shorter-faced components into cocked hats. This brings me to note that a more approved effect will be found to follow the employment of an earlier face of the same sitter, when such is available. A rejuvenescence is communicated, more effective than the importation of a distinct identity. The result is also more assured; for it might go without saying that, inasmuch as the bony fabric of the face ceases to grow when that of the body has reached maturity, so the face of the same sitter must always minutely match, as no other face would do; and, moreover, whatever be the additional plumpness between forehead and chin, it is simply in the nature of a straight-out protection which makes no change of measurement in the features.

The employment of the zero-point of the pupils as a basis for photographic combinations was pointed out in a communication addressed by the present writer to the members, severally, of the British Association when visiting Bristol in 1875. Attention was at the same time drawn to the fact that the photographs of young Mr. Tichborne and of the Tichborne Claimant, respectively, fulfil all the necessary conditions of a successful combination. But by an obliquity for which the writer does not pretend to account, neither the constituted authorities nor professed scientists have acceded to the invitations for a formal inquiry into the matter.—I am, sir, William Mathews.

PRIZES AT THE DUNDEE EXHIBITION.

Dear Sir,—While congratulating, with you, the Council of the East of Scotland Photographic Association on the very liberal prize-list which it has published, I cannot help thinking an error has been made in not giving greater encouragement to a branch of the photographic art which should be in a very prominent position, rather than in a subordinate one, in such an important exhibition as the one to be held in Dundee. I find that while there are to be one gold, two silver, and two bronze medals for portrait and landscape pictures respectively, only one silver medal has been apportioned for genre work.

Now, sir, I believe I express the feeling of many who, like myself, esteem the production of artistically-composed pictures one of the most important and pleasing features of the camera's productions, being thus left out in the cold. What the motive of the council can be in doing so, I cannot imagine. It seems to me that a catholic view of the influence of such exhibitions would have induced a generous policy towards a branch of art that promised to be the very manhood of the true photographic artist.

As far as I have observed, all previous exhibitions have not only encouraged, but have been signalized by, the presence of works in genre, that gave the utmost gratification to the artistic public.—I am, yours,

J. Hutchison Simpson.

Proceedings of Societies.

Thursday Evenings for Photographers.

On Thursday last there was a goodly number of visitors at Ashley's Hotel, to witness Mr. Jarman's promised exhibition of his new "automatic electric lamp" for photographic purposes.

A short delay occurred at the commencement of the proceedings, the carriers not delivering the batteries, &c., till

8.30; but everything at length being in working order, those assembled were amply rewarded for their patience in waiting.

Mr. Jarman commenced by giving a short history of the electric light, and explained the difference between the incandescent light and the voltaic arc—on which latter principle his lamp is constructed—as giving a much more brilliant light than the former. The battery used consisted of twenty-six three-pint Bunsen cells, and was of sufficient strength to keep the lamp going continuously for about ten hours, the carbons being changed every hour. He, however, recommended the use of the bichromate battery, if the lamps be only required for occasional use, this being more handy, simpler, and cleaner to work, and last, though not least, more economical.

The contact of the carbons is maintained by means of an automatic balance, and thus a fairly steady light is obtained.

Plates were exposed by several of the gentlemen present, and the results will be exhibited at the next meeting.

An interesting discussion followed the demonstration.

Several novelties were exhibited by Messrs. Ayres and Brown; and Mr. A. Cowan exhibited and explained the results of some experiments he had been making with developers of different strengths.

Mr. A. Clarke was appointed Chairman for the next meeting, which will be an exhibition of lamps for photographic purposes.

Edinburgh Photographic Society.

On Thursday, the 16th inst., the office-bearers and members of the above Society were invited by Dr. Sidey (late Vice-president) to visit Stabbmill House, his residence at Gorebridge, distant about twelve miles from Edinburgh. A large number availed themselves of his (Dr. Sidey's) kindness, amongst whom, in spite of the weather proving rather unfavourable, there was a good muster of cameras.

The company were met by Dr. and Mrs. Sidey (who had been staying in town) at the Edinburgh Station, and all travelled down together to Gorebridge by the 9.40 train. On arriving they received a hearty welcome from the other members of the family, and were ushered into a room tastefully decorated for the occasion, on entering which they were greeted by a large "Welcome," artistically done in ferns. On the opposite side a table was erected, behind which the two Misses Sidey stood ready to dispense the refreshments with which it was loaded. After duly preparing for the exertions of the day, the party, along with Dr. Sidey, placed themselves and cameras into waggonettes, and drove to the grounds of Arneston, the seat of Robert Dundas, Esq., the vehicles stopping occasionally, as good subjects turned up, to allow negatives to be secured of them. On reaching the village of Temple, where there are the ruins of a picturesque old church, the conveyances were dismissed, and the party proceeded on foot through the remainder of Arneston, and into Dr. Sidey's grounds which adjoin, taking shots at the various objects of interest as they went. On reaching Dr. Sidey's hospitable mansion once more, various groups were taken to commemorate a most pleasant and enjoyable day. About fifty plates were exposed by the party altogether, after which the whole party adjourned to dinner, and did ample justice to the plentiful repast provided for them.

After several speeches, and thanking Dr. and Mrs. Sidey heartily for their great kindness and hospitality, the gentlemen returned to town by train.

Talk in the Studio.

An excellent photograph of H.R.H. Princess Beatrice, in the Council Chamber, Osborne, taken by Mr. J. Thomson, of Buckingham Palace Road, will be published this week.

Bristol and West of England Amateur Association.—The Association has recently acquired a studio of fine proportions for research and experiment, and a well-selected set of apparatus is shortly to be added. The meetings of the Association will in future be held at the Association Studio, Portland Street, Kingsdown.

The Comet.—Dr. William Huggins, Observatory, Upper Tulse Hill, S.W., June 26, writes:—"On Friday night I obtained, with one hour's exposure, a photograph on a gelatine plate of the more refrangible part of the spectrum of the comet which is now visible. This photograph shows a pair of bright lines a little way beyond H in the ultra violet region, which appear to belong to the spectrum of carbon (in some form), which I observed in the visible region of the spectra of telescopic comets in 1866 and 1868. There is also in the photograph a continuous spectrum in which the Fraunhofer lines can be seen. These show that this part of the comet's light was reflected solar light. This photographic evidence supports the results I obtained in 1868, showing that comets shine partly by reflected solar light, the spectrum of which indicates the presence in the comet of carbon, possibly in combination with hydrogen."

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best "Reception Room Notes; on Receiving the Sitter and Taking an Order," to be sent in by the 1st August. No name need appear. For rules, see previous numbers of the News.

Dartmoor.—The phenomenon is due to the reversed action of light; the latter part of the exposure serving to partly undo the effect of the first rays. If you stretch a piece of the so-called mineral paper on the back of one of your negatives, you will be able to touch up the sky very effectually by means of powdered black-lead applied to the paper with a stump. Slow development is unfavourable to reversed action of light.

Please.—There is no work devoted to the matter in question, but all valuable information which has been published will be found in the back numbers of the News and in the Year-Books.

E. B. W.—You should be careful to prevent stray light from the lantern reaching your sensitive paper; but before trying fresh formulæ for the old method, we should advise you to try Morgan's gelatino-bromide paper, which you will find advertised in our columns.

W. J. S.—1. It is possible that you may secure a copy of the work through a second-hand bookseller. 2. There is no simple rule, but the tables given in works on chemistry will give you the means of making the calculations. You must in every case carefully note the temperature, as this exercises a very notable influence on the specific gravity. 3. Either make your solution rather more dilute, or use it while fresh.

T. G. Taylor.—In our next.

Silver.—The salt is the normal chromate.

M. Harron.—Commercial cyanide of potassium is often extremely impure, and consists principally of potassium carbonate. You can extract the pure cyanide by means of boiling alcohol, in which the carbonate is insoluble.

Charlie.—Plain collodion forms an admirable protection for the film.

C. E. G.—1. Your engagement being a weekly one, we fear you have no remedy. 2. See letter by "Young Excelsior" in our present issue. 3. If you voluntarily lend it, you certainly cannot make such a claim.

J. H. L.—Received; in our next issue.

T. L. P.—Under the circumstances, the sulphuric acid tends to remove the elements of water; a carbonaceous mass remaining behind.

Louvre.—You will readily obtain permission to photograph it, but a somewhat complicated set of printed regulations must be conformed to.

O. Bell.—The heaters are charged with crystallised acetate of soda, and are then placed in an oven until the salt is melted.

J. Fuller.—1. We should recommend you to make use of the lens having the longer focus. 2. The maker of the lens is likely to know better than you. 3. A similar proceeding was patented about seven years ago.

A. C.—Flint glass contains a considerable proportion of oxide of lead, and this glass is consequently rather unsuitable for the purpose. Tubing made from hard Bohemian glass can be obtained from any dealer in chemical apparatus.

Rambler.—You are not likely to experience any difficulty if you explain the matter to the officials.

A Carbon Printer.—If your experience shows that insolubility sets in whenever you dry your tissue in the room over the stable, why not find another place? As a rule, no place is superior to a kitchen, provided that you can block out the light, and make sure of being down in the morning before the domestic authorities are about.

J. Elton.—The matter resolves itself into a question of taste. Our opinion has already been given, and we can only express regret that it does not coincide with your views of the case.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1192.—*July* 8, 1881.

CONTENTS.

PAGE
The Ventilation of the Dark Room 313
Photography in the Field 313
At Home—Mr. John Fergus' Studio at Largs 314
A Photographic Trip from Liverpool to Chepstow. By J. H. T. Ellerbeck 315
Composite Portraiture. By Francis Galton, F.R.S 316
Notes 318

PAGE
Topics—Vignettes and Vignetting. By Geo. Bradforde 319
Remedies for Frilling. By H. J. Palmer, M.A. 320
Photographing the Vibrations of the Voice. By C. Cuttriss... 321
Correspondence 321
Proceedings of Societies 322
Talk in the Studio 324
To Correspondents 324

THE VENTILATION OF THE DARK ROOM.

The rapidly-extending employment of the gelatino-bromide emulsion process, even for the general run of every-day portraiture, has necessitated considerable changes in the developing room, every opening or crack through which light might enter being now most carefully covered over or otherwise calked; while, in too many cases, no provision is made for that constant entry of fresh air, which, together with the removal of carbonic acid resulting from respiration or combustion, is essentially necessary in order to maintain the atmosphere in a condition fit for respiration. Considering that the developing room, or, in many cases, rather closet or cupboard, is almost always small, that a lamp or gas jet is frequently kept continually burning, and that in many establishments the door is usually kept shut, even when no use is being made of the place, the danger to health from the inhalation of air too highly charged with carbonic acid demands the careful attention of photographers.

It is well known that atmospheric air in its normal or average condition contains about 4 volumes of gaseous carbonic acid in each 10,000 volumes, the processes of respiration, combustion, and decay serving to keep up the supply; while growing plants exercise a constant decomposing influence on the carbonic gas, and thus remove it from the air. A notable increase in the proportion of carbonic acid present in the air makes itself felt by causing drowsiness, lassitude, and headache in the case of persons inhaling it; and the continual breathing of air unduly charged with carbonic acid is liable to so far weaken the constitution as to enable any latent tendency towards constitutional disease to develop itself in full force. We once noticed a striking illustration of the effect of carbonic acid when we were conducting a laboratory experiment. A large iron bottle containing the commercial liquid carbonic acid was connected with a small steam engine, so that the expanding gas should take the place of steam, the liquid acid expanding to about 500 times its volume on assuming the gaseous state. After this apparatus had been in action for some little time, a painful degree of lassitude was felt; but a thorough ventilation of the apartment served to quickly set matters right again. As bearing on this case, it may be noted that one volume of the liquid acid corresponds to the normal amount of carbonic acid gas in more than a million volumes of air.

In order to illustrate the rapidity with which the oxygen may be removed from the atmosphere of the developing room, we may mention that the flame of an ordinary fish-tail gas burner, or of a moderate sized paraffin lamp, will, in the course of an hour, consume the oxygen contained in about forty cubic feet of air, this oxygen being replaced by carbonic acid gas; while an average adult would inhale about half the above amount, or twenty cubic feet, in the same time.

So much having been said regarding the necessity for thorough ventilation, let us pass on to the practical means for ensuring a proper change of air. The lamp, which is above shown to be the principal agent in rendering the air impure, may serve as a means of securing ventilation. It is merely necessary to connect the top of the lamp with the external air by means of an elbow and a two-inch pipe, while provision is made for the entry of fresh air at the lower part of the room. This latter condition can be very effectually attained by passing a piece of six-inch sheet-iron stove-pipe through the wall near the bottom of the room, and arming each end of this with an elbow turned mouth downwards. The stove-pipe should be lined with black cloth, not only to prevent reflection, but also to cover defective places in the seams.

During the present hot weather, the subject of ventilation is of especial importance; and it is to be hoped that those of our readers who have suffered from the oppressive influence of an ill-ventilated dark room will speedily adopt means of insuring proper ventilation.

◆

PHOTOGRAPHY IN THE FIELD.

Summer is passing, and will soon give place to autumn—the holiday season of most townsfolk. The toilworn photographer who has been working indoors steadily on throughout the year, pines for the breath of the sea-breeze, or a view of waving cornfields, or a broad landscape in its mellow, autumnal hues; for a walk, face to face with nature. He has had enough of human physiognomy. He has pictured its manifold phases, and brooded over its defects and beauties through fog and smoke and city grime. Let us hope that his practice has proved profitable, and that he has taken his staff, and is girding up his loins for a well-earned holiday.

It is curious to behold him issuing forth. He has left his cares behind, and taken his camera, and is going in for field photography. The pursuit of his art is a pleasure to him, and he means to take pictures for the love of the thing.

We met a gentleman, the other day, of the "old school" of photography. He was recounting the victories he had won in the field. Some of his finest pictures were from paper negatives taken quite thirty years ago. He said he used to get most marvellous effects; but then he had to wait for them. He could only take two or three negatives in the year. The first condition he required was absolute calm; not a breath of wind must stir the leaves, for the exposure covered two or three hours. During the exposure he used to go shooting, or to wander through the woods selecting points of view.

He was much astonished at the wonders we disclosed about gelatine plates, and he had grave doubts as t whether work produced in that modern, rapid, slipsho manner would at all compare with pictures taken in the "good old times"—times when one might go and re-arrange the landscape during exposure without marring the result.

This old gentleman's view of the situation is not void of reason. Rapidity nowadays is the rage for outdoor photography. For brilliantly lighted subjects having no broad deep shadows, and depending for the success of the picture partly upon objects in motion, rapid plates ought to be used; but where there are great broad contrasts in lights and shadows, instantaneous plates are most difficult to manage. Take trees, for example: the high lights, where the leaves reflect the sky, will prove much overdone before exposure has secured detail in the shadows beneath. The result will be a weak negative, lacking contrast. We would therefore advise our friends who propose to leave the studio for the field to take with them a number of slow as well as rapid plates.

When it is not desired to portray motion, there can be no object in using extra rapid plates. On the contrary, a lack of discretion in the use of instantaneous plates will lead to disappointment. It is usual to say the negatives, if weak, can be doctored up afterwards. That is not so; as a rule, a gelatine negative treated for weakness will yield a sickly print.

When the best quality of work is desired, the plate should be so constituted, exposed, and developed as to require no after treatment.

Success in out-door photography hinges mainly on the selection of the object or objects to be photographed. In selection there is ample scope for the exercise of the highest artistic culture, as well as for the inborn aptitude which enables an artist to see his picture before it is photographed; in other words, to form a clear impression of the most that can be got out of the materials before him. Should the power of selection be allied to even a slender knowledge of the optics and chemistry of photography, the landscapist may consider himself armed for conquest.

Unhappily, attributes so diverse are rarely combined in the photographer. When the artistic faculty is most fully developed, the power to deal with the niceties of chemistry and mechanics is conspicuous by its absence. The true artist, in his impatience to unfold the beauties he himself has seen in a landscape, forgets that his sensitive plate demands the most delicate treatment before it will yield up its treasures. If he has chosen his plates wisely, and impressed the image with due regard to time, all the beauty he has seen is stored up in the film. It remains for him to bring forth the latent image wearing the charm he has set his heart upon. It is perfectly wonderful how a gelatine plate will respond to the desires of an intelligent operator, provided its powers of pourtraying have neither been over nor under-estimated; but the operator must enter into close fellowship with his plate, and consider well his course before treating its latent image. The successful manipulation of gelatine plates in the field implies nice attention to details, such as must surprise the operator who has won his laurels with wet collodion.

At Home.

MR. JOHN FERGUS' STUDIO AT LARGS.

When we first projected a visit to Scotland, with a view to seeing some of the principal studios north of the Tweed, we made inquiries not only in the photographic world, but also outside that circle, with the object of eliciting opinions as to the most profitable way of spending our time. Strange to say, a most singular unanimity prevailed. Professional and non-professional opinions all centred upon one name, and that was Mr. John Fergus, of Largs.

Where was Largs? A place called Lairg we knew, many miles north of Inverness, for we visited it two summers ago, walking thence on foot over the breezy moorland and purple heather, by heaven-blue lakes and silvery crags to the extreme north-west of Scotland—Cape Wrath—a promontory of red granite rising steeply out of the fretful waves. No, it was not so far north as that, we were told. You went to Glasgow, and afterwards by rail to Wemyss Bay; thence it was another seven miles to Largs, but there was no rail, and a carriage or boat became necessary. To put it roughly, it would cost a Londoner a journey of nearly a thousand miles, or, at any rate, nine hundred, to go to Largs and back.

But if the journey was sure to be a long one, it was equally certain that we must not attempt to sketch the studios of Scotland without including in the number Mr. Fergus' establishment. Nay, so highly esteemed is Mr. Fergus' name by one and all in North Britain, that it is but a matter of course that in attempting to describe Scotch studios, a sketch of his must of necessity come first.

We land from one of the Clyde steamers. Largs, apparently, is a fishing village, but is a modest little watering place as well, though scarcely so well-known as Rothsay, Millport, and Dunoon, hard by. It looks something like a Normandy port. There are a few shops on the quay, and a "Temperance Hotel" painted the colour of *café au lait*. We walk up the main street, consisting of half-a-dozen shops on either side, and thence proceed through the village of quaint one-storied dwellings. Not a sign of a studio is there, so we pass on until we get into the open again. We cross a bridge, and come upon a country road, the houses getting few and far between. Indeed, we are growing despondent, when, at a turning to the right, affixed to a blank wall, we find a modest little direction—"To Mr. Fergus' Studio."

It is a house standing in its own grounds—so quiet and secluded, it might be a hermitage. But the spot is typical of its master. Mr. Fergus does not court publicity. He trusts to his work alone to bring him clients, and labours on quietly without occupying himself with aught else. He has no other studio than this at Largs, where he has been working conscientiously for twenty years past. Those who desire to be pourtrayed by Mr. Fergus must journey to Largs. To within the last year or so, Mr. Fergus has been his own chief operator, and it is only by reason of severe domestic affliction that we find him absent at this moment.

We enter the gallery. It is a fine lofty hall, with a Gothic roof, built of polished pine. The same wood is in the passages and corridors, and makes a handsome flooring. Everything is very neat, and exquisitely bright and clean. The hall and cool corridors are hung not only with photographs, but with many choice paintings; and at intervals are marble statuettes and fresh blossoms to add still further to the brightness and charm of the establishment. Our plan here (fig. 1.) is but a rough one, made from memory, but it will convey some idea of the disposition of the establishment. From the gallery leads a corridor to a flight of steps, by which a longer and larger passage is reached. Connected with this second corridor is a series of five dressing rooms, all elegantly appointed, the rooms leading by other doors to the studios, of which there are three.

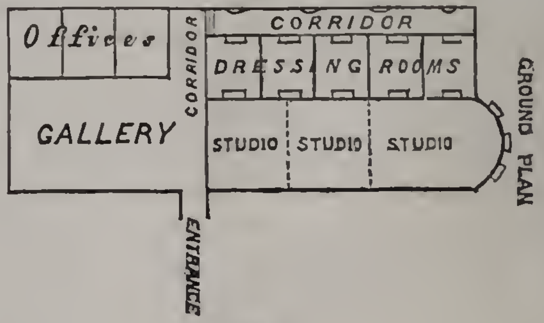


Fig. 1.

Mr. Fergus' principal work is the cabinet portrait. An inspection of a series of these at once proclaims the master. The portraits are simple in pose—soft, and of exceeding brilliancy. Indeed, we have rarely seen such brilliant photographs. They are without glaze, but printed, evidently, on very thickly-albumenized paper, Mr. Fergus showing a predilection for a surface having a slightly roseate hue. Many of the portraits have plain backgrounds; none of them show elaborate accessories. Much taste is evident in the disposal of drapery, and the flowing robes of a model are marked with harmony and detail to the extreme margin of the picture. Yet it must not be thought that Mr. Fergus strives after effect by means of gorgeous raiment; the most charming study we saw was the simple portrait of a widow lady attired in weeds, and crape-trimmed dress. The hair, streaked with silver, and the pale features, were limned with rare taste and delicacy, and in perfect harmony with the white cap and black dress; there was plenty of vigour, and yet no violent contrasts.

Mr. Fergus' charges for cabinet portraits are a guinea for the proof copy, and half a crown for every subsequent print. For cartes, a charge of eighteen shillings per dozen is made; and for the Imperial portrait, in size about twice as big as the cabinet, the proof copy is charged £3 3s., and every subsequent print five shillings.

We pass on to the studio, and, as we do so, cannot help admiring the perfect manner in which the establishment has been designed and fitted. A most complete system of electric bells finds place in the establishment, so that the chief has literally every employé under his thumb. The cool air comes through an open window at the end of the white corridor, and we can look out upon the sunny grounds, the red gravel walks, and dark shrubbery that surround the house. We know not whether the casual visitor is permitted access to Mr. Fergus' charming garden; but we doubt much if any other photographer in the world owns such a delightful residence. Through the dark foliage of fir and laurel are seen glimpses of the blue waters of the Firth of Clyde, while above rise the smooth green hills of Ayrshire—"Burns' ain countrie."

The studios are light and lofty. From our roughly-sketched section (fig. 2.) some idea may be gleaned of their character. On the light side there is dull glass rising to about twelve feet; above that, the glass is clear, while on the shadow side there is also some four feet of clear glass for top light. It goes without saying that the studio is not made use of (except, perhaps, in dull wintry weather) with all this light flooding into it, but that both curtains and screens—the latter especially—are made use of to modify and subdue the wealth of light at the photographer's disposal. Mr. Fergus takes few negatives bigger than cabinet size, and if larger portraits are necessary, these are made in the usual way, by enlarging and printing in pigments.

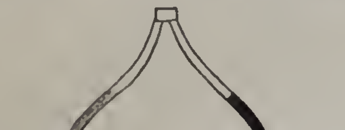


Fig. 2.

The thick black lines represent opaque wall; the shaded lines dull glass; the open lines clear glass.

The wet process still lives at Largs, and seeing the beautiful results that have been secured by collodion, and the success which it has brought in its train, the silver bath is scarcely likely to be neglected for some time yet. Gelatine, however, has knocked at the door here, as at every studio throughout the country, and has received, if not a hearty welcome, at any rate respectful attention. But Mr. Fergus' work is carried on so quietly and methodically, that innovations have not the same influence at Largs as elsewhere.

One can scarcely leave Mr. Fergus' establishment without feeling pleasure in the fact that good reward has followed good work. Says Addison:—

> "'Tis not in mortals to command success,
> But we'll do more, Sempronius, we'll deserve it."

Mr. Fergus certainly deserves the success he has gained, and we are happy, indeed, to find the reward has been so abundant. If we were now asked the question, "Where is Largs?" we should unhesitatingly reply, "Where Mr. Fergus' studio is."

The "By-the-Bye" next week will be, "Taking in the Editor;" the following "At Home" will be, "Mr. Marshal Wane at George Street, Edinburgh."

◆

A PHOTOGRAPHIC TRIP FROM LIVERPOOL TO CHEPSTOW.

BY J. H. T. ELLERBECK.*

A few words touching upon a trip to the Wye may not be out of place at this season, when holidays, if not already taken, are being looked forward to as a source of forthcoming enjoyment.

Starting from Liverpool we get to Shrewsbury in two hours. Shrewsbury and Haughmond Abbey are mentioned only for the sake of those who did not join our excursion last year. The abbey, churches, and old streets will produce a dozen pictures.

From Shrewsbury to Ludlow occupies one hour, passing and calling at Craven Arms, near which, and close to the line, is Stoke Castle—well worth a plate or two. There is a full day's work at Ludlow. The castle (all close views), the interior of the church, the Feathers Hotel (worth an inside inspection also), Ludford House, bride and village, black and white houses, and mill on the river, will occupy both morning and evening light. Many very pretty river "bits" can also be got.

Another hour brings us to Hereford. Here is work for a wide-angle lens, space being limited, unless you either cross the river and take in bride and tower or the Bishop's palace as a foreground, with a long-focus lens. I got a good view from the band platform in the centre of the public gardens (morning). The interior will furnish several pictures. The old house is also a good subject.

From Hereford to Ross is the next stage. Of Ross I do not know much, but from hearsay I have no doubt it is worth a visit. The interior of the church, with the tree growing, is especially interesting.

From Ross the Wye begins its characteristic features, and reaches the climax at Symond's Yat. Here every tourist should alight. He can take two or three views from the station alone, and some from the opposite shore. For the Yat itself the hill behind the station must be ascended. There is a magnificent panorama on a clear day from the summit, embracing many counties and valleys.

From this place it is better to take boat to Monmouth, as there are views of rock and river most charming on the way almost inaccessible by the road. Monmouth furnishes a few subjects to those who have time. Troy House is close to the railway station. The country round is worth exploring, but we hurry on by next train to Tintern. Our traps being heavy, we take another "trap" to the Abbey, but regret it after the first bend in the road, for the river bits here are delightful. Of course at the Abbey the usual bell must be rung, the usual old lady summoned, and the usual sixpence paid; but you get left alone, and that is everything.

For all views of Tintern Abbey a wide-angle lens is advisable, as the place is surrounded closely on all sides by cottages, orchards, and walls. Only by crossing the river, or climbing to the church or upper roads, can a long-focus lens be used. Perhaps the most complete view is from the high road with a wide-angle lens at three p.m., and of the west window with an ordinary lens upright. You must have a considerable rising front for all such pictures. Mine shifts three inches for upright views, and nearly two inches for oblong pictures (I got extra screw holes put in), and this is frequently not sufficient without tilting.

---

* Read before the Liverpool Amateur Photographic Association.

The interior views of the Abbey are only limited by time. Decidedly stop here a night at least, and do Chepstow Castle in a half-day—morning being best. Four plates, or six at the utmost, are sufficient for Chepstow—one from the bridge, others close, and interior. Only the entrance can be done outside; there is no use of going to the back, as there are too many trees. At Tintern we stopped at Walnut Cottage, and if anybody desires to meet with real kindness, let him go there too; but don't expect luxuries.

We went next to Raglan. It is a fine drive across the country, but we went, for economy's sake, by rail. The delay *en route* at Monmouth affords an opportunity for taking Troy House, mentioned before, and the town, hills, and river from the railway bridge.

Raglan Castle is but a short walk from the station of that name, and no conveyances meet the trains. If you order one, you pay 2s. 6d., and the driver, for less than a mile's drive. Here also you must wait the effects of the morning and afternoon's sun to secure the best results. I prefer the morning if only one half the day can be spared; but it is well worth spending the whole day there. Here, again, a short-focus lens is useful; you can work with the other, but got no sky or foreground. The lens I carry for this purpose is a wide-angle rectilinear, and so wide that special care must be taken not to be taken in—I mean in the picture. In three cases I find myself too obtrusive in one; the whole head and face is distinct, although so close. While on this subject it may be a hint to some who want an "object" in the foreground sometimes to tell an old dodge. With the ordinary rapid rectilinear I use a drop shutter frequently, one of my own make, and held in position by a common pin; then, when the "object" is required, and no figure handy, tie one end of a reel of cotton to the pin's head, and unravel till the operator is in position. A pull at the cotton, and the exposure is complete. You will see an example of this among those exhibited to-night. The wide-angle rectilinear gives first-class views with single lens merely, but suitable only for landscapes, being so slow. The village of Raglan contains two or three "bits," and the church interior contains, I am told, some good monuments.

Further down this line is Pontypool, and the great viaduct, but we branched off at the junction and stopped again at Usk—a clean little town of no interest, but there is a good river and fine open valley. One of my best views was taken from a hill south of the town, overlooking the river, town, bridge, and castle—a good combination—and some fine natural clouds, which I did not expect. Usk Castle is not worth the climb up as it is only a husk. From here we went to Abergavenny, which is surrounded by fine hills and river scenery. There is an old ruined castle here, too, but we did not stop more than two or three hours. We had intended to go on to Brecon—one of the prettiest-situated towns in this district, but could not; so returned by the same route home.

I exposed about five dozen plates, not including figure studies, and do not regret one, except those spoilt by my own carelessness. The trip abounds in beauties of the most varied character, many of which, from want of strength, were denied to me. The whole could be accomplished in a week easily, or plenty of other places could be added to prolong it—South Wales, Wells, and Glastonbury, southwards; Warwick, Kenilworth, and Stratford-on-Avon could be taken on the journey home.

The above is but a brief summary of our journey. I did not mention the Wyndcliffe, at Tintern—another centre of attraction, as there is a magnificent view from the summit.

To us, who are constantly on the look-out for photographic trips, records of this class are valuable. How many who go away even mention where they have been! Mr. Day has suggested, and I beg to second the proposition, that we keep an excursion book for every member to enter his experiences in. This book to be kept for reference at any time. This could be made exceedingly valuable if the details of large districts were specified, and the time of day suitable for each. It is so easy to go to a locality and entirely miss the best points if not instructed beforehand; and, on the other hand, it would tend to save much valuable time by knowing which direction to take for morning views, and which for evening.

COMPOSITE PORTRAITURE.

BY FRANCIS GALTON, F.R.S.[*]

I PROPOSE to draw attention to-night to the results of recent experiments and considerable improvements in a process of which I published the principles three years ago, and which I have subsequently exhibited more than once.[†]

I have shown that, if we have the portraits of two or more different persons taken in the same aspect, and under the same conditions of light and shade, and that if we put them into different optical lanterns converging on the same screen, and carefully adjust them—first, so as to bring them to the same scale, and, secondly, so as to superpose them as accurately as the conditions admit—then the different faces will blend surprisingly well into a single countenance. If they are not very dissimilar, the blended result will always have a curious air of individuality, and will be unexpectedly well defined; it will exactly resemble none of its components; but it will have a sort of family likeness to all of them, and it will be an ideal and an averaged portrait. I have also shown that the image on the screen might be photographed then and there, or that the same result may be much more easily obtained by a method of successive photography, and I have exhibited many specimens made on this principle. Photo-lithographs of some of these will be found in the Proceedings of the Royal Institution, as illustrations of a lecture I gave there "On Generic Images" in 1879.

It will be convenient that I should again explain the best of the many processes that I have already published. It is simple enough in idea, but difficult to carry out with the scrupulous accuracy of adjustment that is needed for really good results. I have, therefore, little doubt that some photographers may have tried it, or some other of my plans, and failed, and that they consequently have abandoned what I believe is likely to become a new and not unimportant branch of their art. I will exhibit and explain the apparatus as it stands, and will indicate some improvements as I go on. The apparatus is here. I use it by gaslight, and employ rapid plates, which, however, under the conditions of a particularly small aperture, and the character of the light, require sixty seconds of total exposure. The apparatus is 4 feet long and 6½ inches broad; it lies with its side along the edge of the table at which I sit, and it is sloped towards me, so that, by, bending my neck slightly, I can bring my eye to an eyehole, where I watch the effect of the adjustments which my hands are free to make. The entire management of the whole of these is within an easy arm's length, and I complete the process without shifting my seat.

The apparatus consists of three parts, A, B, and C. A is rigidly fixed; it contains the dark slide and the contrivances by which the position of the image can be viewed; the eyehole, *e*, already mentioned, being part of A. B is a travelling carriage that holds the lens, and is connected by bellows-work with A. In my apparatus it is pushed out and in, and clamped where desired, but it ought to be moved altogether by pinion and rack-work. The lens I use is an I B Dallmeyer. Its focal length is appropriate to the size of the instrument, and I find great convenience in a lens of wide aperture, when making the adjustments, as now I require plenty of light; but as to the photography, the smaller the aperture the better. The hole in my stop is only two-tenths of an inch in diameter, and I believe one-tenth would be better.[‡]

---

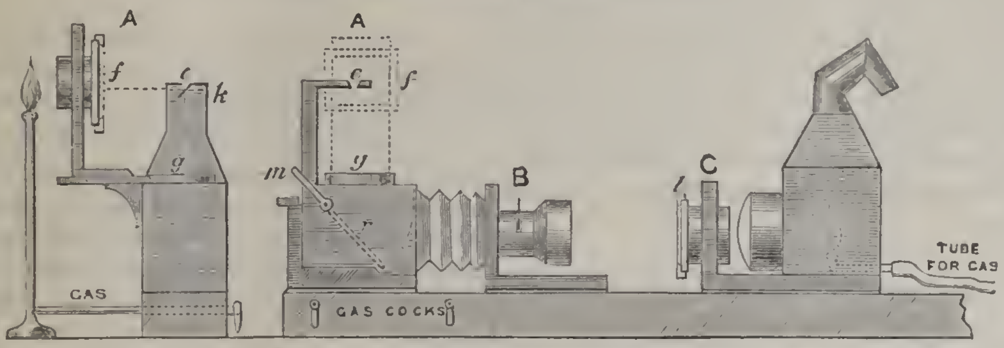
[*] Read before the Photographic Society of Great Britain.

[†] "Composite Portraits," Journal of the Anthropological Institute, 1878, reprinted in *Nature* and in the PHOTOGRAPHIC NEWS, and translated in the *Revue Scientifique*. Also "Generic Images," Proceedings of the Royal Institution, 1879.

[‡] A small aperture helps to remove a cause of fog, due to the source of illumination not lying in the same plane as the transparency, but behind it. Suppose an isolated black dot, p, in the transparency—call its image on the focussing-screen m; let the point in the illuminated surface that lies in the prolongation of $m\,p$ be called p'. Then, to produce an image free from fog, every ray proceeding from p towards the lens ought to be intercepted by p. This, however can never be the case under the above conditions. Since m is in focus for rays proceeding from p, the focus for rays proceeding from the more distant point p', will be somewhere in front of m. Consequently those rays from p' that skirt p, and that fall upon the outer portion of the lens, will be brought to a focus in front of m; they will diverge as they proceed further, and will form a blur of light that will overspread m; in short, they will cause fog. Owing to this cause, we cannot have perfect sharpness in any contour line in the image of a transparency that is illuminated by a mirror reflecting the light of the sky, or by a distant sheet of white paper. The remedy is two-fold: one part consists in bringing the source of illumination as near as possible to the transparency, and the other is to use a very small aperture. I rest the transparency against a ground-glass plate, not too strongly illuminated from behind, and which itself becomes the source of illumination. I do not like to put the *face* of the transparency against the *face* of the ground glass without introducing certain other difficulties; thus the image somewhat loses its definition, and

C is a travelling carriage that supports the portraits in turn, from which the composite has to be made. I work directly from the original negatives with transmitted light; but prints could be used with light falling on their face. For convenience of description I will confine myself to the first instance only, and will therefore speak of C as the carriage that supports the frame that holds the negative transparencies. C can be pushed along the board and be clamped anywhere, and it has a rack and pinion adjustment; but it should have been made movable by rack and pinion along the whole length of the board. The frame for the transparencies has the same movements of adjustment as those in the stage of a microscope. It rotates round a hollow axis, through which a beam of light is thrown, and independent movements in the plane, at right angles to the axis, can be given to it in two directions, at right angles to one another, by turning two separate screws. The beam of light is furnished by three gas-burners, and it passes through a condenser. The gas is supplied through a flexible tube that does not interfere with the movements of C, and it is governed by a stop-cock in front of the operator.

Diagram showing the Essential Parts.



A The body of the camera, which is fixed.
B Lens on a carriage, which can be moved to and fro.
C Frame for the transparency, on a carriage that also supports the lantern; the whole can be moved to and fro.
r The reflector inside the camera.
m The arm outside the camera attached to the axis of the reflector; by moving it, the reflector can be moved up or down.
g A ground-glass screen on the roof, which receives the image when the reflector is turned down, as in the diagram.
e The eye-hole through which the image is viewed on *g*; a thin piece of glass immediately below *e* reflects the illuminated fiducial lines in the transparency at *f*, and gives them the appearance of lying upon *g*—the distances *f k* and *g k* being made equal, the angle *f*, *k*, *g* being made a right angle, and the plane of the thin piece of glass being made to bisect *f*, *k*, *g*.
f Framework, adjustable, holding the transparency with the fiducial lines on it.
t Framework, adjustable, holding the transparency of the portrait.

The apparatus, so far as it has been described with any detail, and ignoring what was said about an eye-hole, is little else than a modified copying camera, by which an image of the transparency could be thrown on the ordinary focussing-screen, and be altered in scale and position until it was adjusted to fiducial lines drawn on the screen. It is conceivable that this should be done, and that the screen should be replaced by the dark slide, and a brief exposure given to the plate; then, that a fresh transparency should be inserted, a fresh focussing adjustment made, and a second exposure given, and so on. This, I say, is conceivable, but it would be very inconvenient. The adjusting screws would be out of reach; the head of the operator would be in an awkward position; and though these two difficulties might be overcome in some degree, a serious risk of an occasional shift of the plate during the frequent replacement of the dark slide would remain. I avoid all this by making my adjustments while the plate continues in position with its front open. I do so through the help of a reflector, temporarily interposed between it and the lens. I do not use the ordinary focussing-screen at all in making my adjustments, but one that is flush, or nearly so, with the roof of the camera. When the reflector is interposed, the image is wholly cut off from the sensitized plate, and is thrown upwards against this focussing-screen, *g*. When the reflector is withdrawn, the image falls on the plate. It is upon this focussing screen in the roof that I see the fiducial lines by which I make all the adjustments. Nothing can be more convenient than the position of this focussing-screen for working purposes. I look down on the image as I do upon a book resting on a sloping desk, and all the parts of the apparatus are within an easy arm's length.

My reflector in my present instrument is, I am a little ashamed to confess, nothing better than a piece of looking-glass fixed to an axle within the camera, near its top left-hand edge. One end of the axle protrudes, and has a short arm; when I push the arm back, the mirror is raised; when I push it forward, it drops down. I used looking-glass because the swing action is very true, and as my apparatus was merely a provisional working model, made of soft wood, I did not like to use sliding arrangements, which might not have acted truly, or I should certainly have employed a slide with a rectangular glass prism, on account of the perfect reflection it affords. And let me say, that a prism of two inches square in the side is quite large enough for adjustment purposes, for it is only the face of the portrait that is wanted to be seen. I chose my looking-glass carefully, and selected a piece that was plane and parallel. It has not too high a polish, and therefore does not give troublesome double reflections. In fact, it answers very respectably, especially when we consider that perfection of definition is thrown away on composites. I thought of a mirror silvered on the front of the glass, but this would soon tarnish in the gas-light, so I did not try it. For safety against the admission of light unintentionally, I have a cap to the focussing screen in the roof, and a slide in the fixed body of the instrument immediately behind the reflector, and before the dark slide. Neither of these will be wanted when the reflector is replaced by a prism, set into one end of a sliding block that had a large horizontal hole at the other end, and a sufficient length of solid wood between the two to block out the passage of light both upwards and downwards, whenever the block is passing through the half-way position.

As regards the fiducial lines, they might be drawn on the glass screen; but black lines are not, I find, the best. It is far easier to work with illuminated lines; and it is important to be able to control their brightness. I produce these lines by means of a vertical transparency, set in an adjustable frame, connected with A, and having a gaslight behind it. Below the eyehole *e*, through which I view the glass screen *g*, is a thin piece of glass set at an angle of 45°, which reflects the fiducial lines and gives them the appearance of lying on the screen, the frame being so adjusted that the distance from the thin piece of glass to the transparency and to the glass screen *g* is the same. I thus obtain beautiful fiducial lines, which I can vary from extreme faintness to extreme brilliancy, by turning the gas higher or lower, according to the brightness of the image of the portrait, which itself depends on the density of the transparency that I am engaged upon. This arrangement seems as good as can be. It affords a gauge of the density of the negative, and enables me to regulate the burners behind it, until the image of the portrait on *g* is adjusted to a standard degree of brightness.

(*To be continued.*)

---

the grain of the ground glass, or any dust on its surface, is photographed with unwelcome precision. As for the aperture, I use a stop the hole in which is too small to admit an ordinary lead pencil.

COMMISSIONERS OF PATENTS FOR INVENTIONS

Notes.

Already a close analogy has been established between the eye and the sensitive plate by M. Boll, who proved that behind the lens of the eye is located a purple film, which has all the properties of photographic sensitiveness. This "visual purple," as it is termed, may be impressed with an image, which image it is possible to fix with gallic acid. Of course, in the living animal, the image thrown upon the retina or "visual purple" is not fixed—although, if the image is a very vivid one, it is, as all of us know very well, apparent for some time after we have closed our eyes; but the picture fades away, and the "visual purple" is resensitized or revivified by other animal tissue in contact with the purple.

A further analogy is now shown to exist between the eye and ordinary photographic films, by MM. Macé et Nicati, who have just contributed an interesting paper to the *Académie* on what, for want of a better name, is termed colour-blindness. Some photographic films, as we are aware, are distinguished by particular sensitiveness to the blue rays, while others are capable of receiving impressions from red rays. So it is with the human eye, according to these French authors. People afflicted with poor sight lose their appreciation of red rays. Blue rays are still distinct enough to them, but all others, and especially the red, are indistinct. Thus poor eyesight answers pretty well to a sensitive iodide film, while healthy sight is more analogous to bromide, which sees further into the red of the spectrum. There are regions, however, at both ends of the spectrum, in the ultra-red and ultra-violet, which are invisible to the eye, but which a photographic film readily appreciates.

We hasten to correct a mistake. Not only did Mr. H. A. H. Daniel receive a silver medal at the recent Plymouth Exhibition, but Mr. W. J. Byrne, of Richmond, was the recipient of a similar honour. Moreover, the Secretary of the Exhibition writes that Mr. Byrne's award was "the first silver medal, the highest award in photography."

Hamburg is to have a conference of photographers as well as Frankfort. The gathering takes place on August 2. There is a local committee—organised after the manner of the British Association—to look after the wants of strangers. Herr C. W. Lüders, 34, Steinstrasse, is the secretary.

We are told that the "criminal album" of the Berlin Police Office had only 482 additions made to it during the past year, as against 2,135 of the previous twelvemonth.

"That won't do; you are not looking at all pleasant," he said to the sitter. And with that he turned round a screen, at which the sitter was looking, and displayed a big picture of the laughing curé, whom our readers have frequently seen labelled Zozodont. The risible countenance of the curé was at once reflected in the face of the sitter, and the ruse succeeded perfectly, as it had done many times before, no doubt. It was at Barraud and Jerrard's studio.

The manner of transferring negatives by the aid of sheet gelatine, which, after treatment with alum, is moistened and put upon the film to be stripped, is, as M. Warnerke bore testimony at the last meeting of the Photographic Society, a most excellent plan. We called particular attention to the use of gelatine for this purpose in 1877, as also to its eligibility as a basis for carbon transfers when transparencies are desirable.

In this last connection, we may mention a very apt application. A memorial window was erected in 1876 to the late Colonel Milward, R.A., C.B., and it was suggested that subscribers should receive a photograph of the window. A negative was taken and printed in carbon, and the image finally transferred to sheet gelatine, when a *facsimile* in miniature of the original was at hand. The subscribers each received a little window, the design stained, however, only in purple monochrome, instead of in various colours.

A touching story. An interesting case came before a Frankfort tribunal last month. A café proprietor wanted a presiding goddess for his establishment, and requested applicants to enclose their portraits. One picture came—the charming bust of a lovely woman—which at once settled the matter. The café proprietor telegraphed for the lady to come, and to come immediately. Not only this, but he sent the money for her journey, and waited on her at the station—all anxiety to see the sylphide arrive. What was his horror to see step out of a coupé a thin, elderly woman, her face pitted with the small-pox.

The result was a bitter controversy, ending in the man detaining the woman's box and property as security for money advanced. Accordingly, she brought an action, and at the trial the café owner justified his conduct by reason of the deception practised upon him. The lady's retort was that she sat for the photograph in question, which was delivered to her as the court saw it. The lawyers passed the picture round, examined it, and shook their heads; whereupon the plaintiff, in a fit of irritation, seized the picture, and applying her tongue vigorously to the surface, removed all traces of the retouching brush, and laid bare an undoubted image of herself. Verdict in favour of the plaintiff; the lady to have her box and fifteen marks.

The moral of the story is obvious; only, unfortunately, when the retouching is done on the negative, neither the tongue nor the moral can be applied. Ladies should be content with a reasonable amount of retouching. At any rate, the Frankfort story is a repetition of history; it is King Henry VIII. and Anne of Cleves over again.

St. Claire Deville, the well-known French chemist, died last week.

The Melbourne Bank no longer requires its clerks to give security against loss or theft; their photographs deposited with the directors is held to be sufficient assurance of their good conduct.

“This was not made, mind you; it was found on a girl, and bought,” was Mr. Robinson's laconic remark to us a few days ago, on complimenting him upon the picturesque costume of one of his models. It would seem that photographers, no less than painters and actors, must purchase garments as they see them worn, if they wish to make satisfactory pictures. Mr. Toole, it is said, bought the old corduroy suit he wears as “the Artful Dodger” from a man he met in the vicinity of Seven Dials.

Mr. Hubbard did the same in the production of the charming pictures—“Stolen Moments,” “Preparing for Dinner,” than which no more beautiful compositions have ever been secured by the camera. Said Mr. Hubbard, in an interesting account he gave some years ago of his work in connection with the pictures: “I frequently had a run round in the evening to the wardrobe and old-furniture shops, trying to pick up anything that would be suitable to put into my picture. It was upon one of my evening rounds that I saw the striped skirt upon my model, and this a woman sold me from off her back.”

Topics of the Day.

VIGNETTES AND VIGNETTING.

BY GEO. BRADFORDE.

If anyone for a moment turns a retrospective eye upon the changes that have taken place in photographic portraiture during the past fifteen or twenty years, he will truly be amazed to find that the carte vignette has held its own, despite every effort to displace it, and is still a great favourite with the public. During the before-mentioned period there has been an infinity of attempts made to get out of the old-fashioned groove; there have been all manner of scenic effects. Rembrandt lighting and telling accessories tried, still the quiet respectable vignette triumphed; then there came a decided and serious attack upon the size; cabinet, victoria, boudoir, imperial, panel, have all had their trial, but, with the exception of the cabinet, they have one and all failed to make the carte vignette less of a favourite than before.

For my own part, I love the vignette dearly—its simplicity, its chastity, is charming. The eye rests at once upon the lineaments of some dear friend: you look into his or her eyes: you catch the quick well-known glance or the kindly smile: you see—you behold, your friend. In the vignette your thoughts become wholly centred on the face before you; there is no showy dress or green-house scene behind, to divide your attention; no conglomeration of ancient furniture surrounding the figure to make you smile, and express a wondering wish to know where in the world your friend had wandered to.

Just fancy your jolly, rattling friend Jones—Jones the jocular, whom you have always been accustomed to associate with laughter, and seen him oftenest smiling from the depths of an easy chair with a yard of clay in his hand—fancy him, I say, seated in a high-backed study chair, with a curiously-carved Davenport beside him, and the folds of a rich velvet curtain shimmering behind him. Then, instead of his pipe, he has his forefinger thrust between the leaves of a book, making him look as if, at last, he had seen the error of his ways, and had taken to teaching a Sunday school as penance for his former jollity. Now all this is obviated by the vignette; get a nicely-lighted face of old Jones, make him feel at home, catch the merry twinkle in his eyes, and his friends, when they look upon it, will in their mind's eye fill in the well kept frame, and supply his dumpy hand with the yard of clay.

The love that early aspirants yea, and latter-day ones likewise—indiscriminately show in dragging all manner of inharmonious furniture into their pictures, has helped greatly to bring down upon the profession the bitter flouts and gibes of the critics and students of the palette and canvas. If the incongruities were not so pitiable, one might make merry over a collection of such. Here you would find a delicate young lady without hat or wraps standing in front of a bleak leafless wood, the whole picture breathing neuralgia and rheumatism; then again you find a gentleman with his hat on sitting in a high-backed Elizabethan chair, writing at a desk of stained wood that you can buy anywhere for 15s. 6d.; you will find sportsmen in gardens, students on moors and fenlands, milkmaids in drawing rooms, soldiers perambulating by the sounding sea, and sailors shivering their timbers in a corridor, with a pedestal for the main mast, and a cheap damask curtain doing duty for the top royals, just to show that they are under easy sail.

I am no lover of accessories. I have worked in studios where one could hardly move for chairs, tables, *prie-dieus*, rocks, stiles, and mysterious pieces of furniture that you could turn into sideboards, desks, chiffoniers, pianos—mangles, for aught I know. Well, the consequence of this was, that the sitters took a fancy to the particular piece of furniture that would not suit them. There was no use in your trying to instil into them the fact that you knew best what would suit them: you had to give them *their* own way, and then take *yours*. But this sort of thing (on a busy day) was not desirable. In my opinion, the studio should be bright and comfortable with a few well-chosen articles of furniture.

Some photographers prefer to take their vignettes with their subject (I was going to say sitter, only that would have made a bull of this sentence) standing. What their reasons may be I cannot say; but, for my part, I fancy you can make your sitter feel ever so much more at home sitting comfortably in a chair, than standing bolt upright, with nothing to support him but the head-rest.

The lighting for vignettes should be of a peculiarly soft order, and arranged in such a manner as to fall on the face delicately and gently—touching first the temple, then the cheek, nose, and, finally, the chin. The temple is where the strongest lights should show, and from that point gradually diffuse itself over the face until that perfect roundness, so essential in a good photograph, is visible on the ground glass of the camera. If the exigencies of your studio require you to use a reflector, do not use it too near the sitter, or you will never obtain satisfactory results; even if you get a certain roundness, you will be troubled by a cross-light, which will appear with worst effect in the eyes, and with the eyes—“the windows of the soul”—damaged, the picture is not worth anything. To obviate this, I advise, instead of the small white reflector commonly in use, to get as large a one as the studio will allow of, and let it be of a dull cream colour. Let it reach down to the floor, and be about six feet high, and put castors to it, so that you may have no trouble in shifting it about. With this style of reflector you can enclose your sitter, so to speak, and by moving the castors nearest the camera to, or from, the light, you can get whatever effect you choose. This reflector does away with the sharp, hard-looking, glass glare of the pure white one; it catches the rays upon its own pleasant surface, and immediately imparts its mellowness to the shadows on the sitter's face.

The background for general use should be of a much lighter tint than what is used for pictures requiring plain printing. There used to be such a shaded circular background in the market, meant especially for shadow or Rembrandt pictures, that I used to like very much. It was light; you could carry it about in one hand, place it wherever your judgment thought best, and get whatever shade you wanted for all shades of hair or complexion. If you could get a clever hand at the brush to shade one for you, by all means get it. I think it was an invention of Solomon's; but they did not take, somehow—possibly because they were cheap.

Some time since, a vignette with a black edging or background tried to find a footing. By some, I believe, it is still admired; but I think the general public looked upon its sombre hue as being too much akin to mourning; and, indeed, I fancy the style is more suited to departed friends than those still in the flesh. With these pictures a black velvet background was used, and the vignetting was done during the taking, a piece of thin wood or cardboard, with a small oval cut in the middle, being fixed tightly within the camera. Of course the negative was printed plain; but, with the usual vignette, what art there is to produce a really good print!

Some photographers—but I must say they are few—will use nothing but stained glasses for vignetting. There are two objections to glasses: first, they are liable to smash; and next, they are vilely shaped. Yet, by being very careful, you can defy the first objection, and, by a judicious use of two or three arranged above each other, you can remedy the latter; but where time is of great moment, I most decidedly pronounce the glasses a bore. You may easily waste half-an-hour searching for right-fitting glasses, and then not get exactly what the picture required. Years ago, I dropped in upon a north-country photographer, and found that he made his own vignetting boards—and boards they literally were—square pieces of deal, half-an-inch thick, with the oval in the centre; the side that went nearest the picture being bevilled away, so as to give the desired shading. These were better than the glasses in one respect—they would not smash; but the same objection as to time stood good. Now this can all be remedied, time saved, and the exact size obtained in a most simple manner. In every photographic business there is more or less of waste cardboard—specimens that get old and dirty, &c. With these, and a pair of scissors, you can, in a moment, fit any picture. Sketch the rough outline of what you require on the cardboard, then cut out and notch the edge all round, so that, if necessary, you can raise it or depress it at whatever part your judgment prompts you. With a little cotton-wool applied, so as to prevent too great a spread towards the waist—thus spoiling the symmetry of the picture—very gratifying results are obtained. The plan is old, but a good one still.

Everyone knows that a diffused light is best to print vignettes. I cannot do better than finish this Topic by mentioning two little dodges that came under my notice some time since. They are both upon the same principle, and their simplicity is even laughable; but the printer of vignettes will at once see their utility. The first dodge was nothing more nor less than two of those huge square scales that you may see in rag-stores, or on the wharves of minor marine towns; these were hung from the beams of a glass-covered passage. On these were placed the vignettes, and every time the printer went past he touched the edge and sent it gently whirling round. The other dodge was, in my estimation, an improvement upon the first. It consisted in a light circular board being attached to a large roasting-jack. All that the printer had to do here was to wind it up every hour, when he obtained beautifully shaded prints.

The "Topic" for next week will be, "Sunshine," by H. P. Robinson.

REMEDIES FOR FRILLING.

BY H. J. PALMER, M.A.*

It has occasionally occurred to me, as I have read in our photographic journals the enunciation of some theory which seemed at variance with my own observation and experience, that it would be a useful labour for practical photographers occasionally to note down statements of photographic doctrine or practice which appeared to them from their own knowledge to be fallacious, and then to make known this divergence of experience, either through the societies to which they belong, or through the medium of one or other of our periodicals. It, of course, by no means follows that divergent experiences necessarily involve error or misstatement on the part of any of the individuals who record them; but changes of lights, and times, and surroundings result in such altered relations in matters photographic that good would, I think, of necessity follow were we occasionally to call attention to these variations.

As an instance of what I mean I may mention that I read some time ago, in a paper by an able worker in Alpine scenery, that, to secure a satisfactory result in exposures on this class of subjects, where a brilliantly-snowy background of peaks is contrasted with a foreground more sombre in its details, it is advisable to expose for the foreground, and leave the snow peaks to take care of themselves. Now, my own experience, as one who has for many years made an annual photographic pilgrimage to the Alps, leads me to a very different conclusion, and tells me that, on a dry plate of any kind, and in spite of any amount of skilful manipulation of the developer, the distance would be simply obliterated in the case of an exposure made thus. Or, again, we have had numerous remedies suggested for the cure of the *bete noir* of the gelatine process (when plates are prepared in warm weather), the frilling or blistering nuisance; but I suspect that considerable doubt as to the uniform efficacy of each remedy would result from a comparison of experiences.

I have been induced to suggest this subject of frilling and its remedies, as one likely to be a profitable one for discussion to-night, from the fact that I have recently been battling with the evil in a very aggravated form in a batch of commercial plates recently purchased for use in my summer holiday in Switzerland, and also because it is in the summer months especially that the trouble and difficulty of blistering or frilling films try our tempers and patience.

I myself, some years ago, found, as I thought, a most reliable cure for films diseased in this way in raising the temperature of the plate, either in a moderately-heated oven, or on the bottom shelf of my drying cupboard, where the temperature is considerably above that of the other shelves. Another remedy prescribed for the evil lies in the use of a pinch or two of Epsom salts in the solutions and washing water employed. Further cures have been suggested in pyrogallic development with warm water; in the disuse of alkaline developers, and the substitution of ferrous oxalate; in the employment of a film of collodion over the decomposed gelatine surface; and, most useful and most recent of all remedies, the steeping of the infected plate, between development and the fixing and washing operations, in a saturated solution of alum.

Now I am bound to say that in the case of this first dozen of a batch of a gross of plates, of which I deemed myself the unfortunate possessor, one and all of those remedies, including my own, in which I had imposed the most implicit confidence, failed me utterly. The Epsom salts, collodion film, and heating the plate did not even moderate the evil; but seemed (and this is especially so in the case of the collodion) to make matters worse than ever. I did not try warm pyrogallic, from sheer want of faith in it; but some degree of mitigation was effected by the use of saturated solution of alum employed before and after every operation of development, fixing, and elimination of the hyposulphite; but, notwithstanding every effort, a complete cure seemed unattainable.

As a last resource, I made a very strong solution of Epsom salts—not very much weaker than a saturated solution—and in this I soaked a plate or two before development, and again before fixing. The frilling and blisters no longer appeared, and I felt that at last I had hit upon a complete cure.

One object which I have in view in mentioning this fact this evening, is that other workers who may find themselves in a similar plight may try the same remedy, and, for the common good of gelatine workers, let us know if there be any divergence between their experience in this matter and my own.

I do not know to whom we are indebted for the suggestion of the use of Epsom salts for this purpose. In the case I have described, while the weak solution of the salt was as powerless as any of the other means employed to arrest the nuisance, a preparation containing two ounces of the salt to four of water proved completely efficacious.

In conclusion: I must express my opinion that every batch of plates sold by manufacturers to the photographer ought, in justice to both parties, to be thoroughly tested before they are allowed to be placed in the hands of a purchaser. It is only fair to the maker from whom I purchased the batch in question to state that, as soon as he heard of my experience with his plates, he at once offered to exchange them, and that I have accepted the offer. But I think that we have a right to be sure that, when we purchase commercial plates, we are not buying glass *plus* so much decomposed gelatine, for this is an article utterly worthless for photographic purposes.

---

* Read before the Liverpool Amateur Photographic Association.

PHOTOGRAPHING THE VIBRATIONS OF THE VOICE.

BY C. CUTTRISS.

Reading of the experiments of Messrs. Bell and Tainter on the photophone, the idea struck me that the vibrations of the voice might be photographed. Not having the facilities to carry out the experiments, I communicated the idea, with a sketch, to my brother, Thomas Cuttriss, Leeds, who has carried it out as follows:—A box, blacked inside, has a shelf, A, on which slides the saddle, B, which carries the plate, E, and shaft, D, by which the plate is rotated. C is a silk thread fastened at one end to the shelf, the other being wrapped round the shaft, D, in that way, when the shaft is turned, traversing the plate in front of the slit, F, and the movable shutter, G. The shutter is connected to the diaphragm, H, by the wire, I, and is opened and closed by the vibrations of the diaphragm. A powerful light is focussed upon the slit (sunlight was used in our experiments), and the plate rotated as steadily as possible while speaking upon the diaphragm.

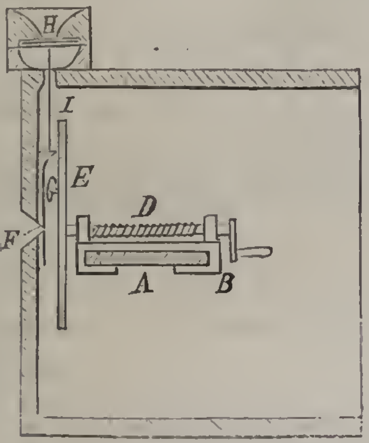


Fig. 1.

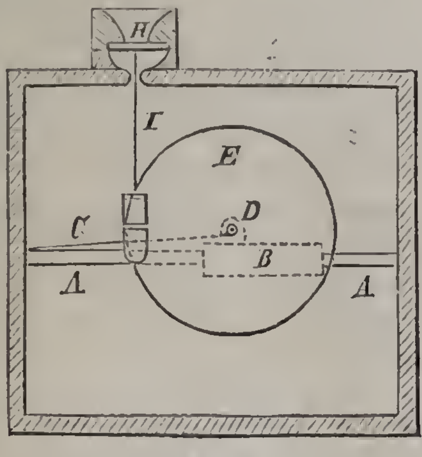


Fig. 2.

The plate, on being developed, showed a spiral, across which were dark lines showing on the outer circles the vibrations of the diaphragm very distinctly (see fig. 3); but owing to the much slower speed of the plate, as it drew nearer the centre, the vibrations there merged into a dense fog, and were lost.

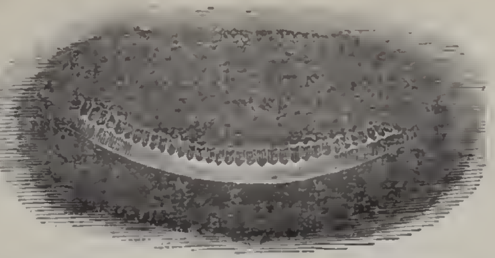


Fig. 3.

The vibrations are similar to the indents on the tinfoil of Edison's phonograph. We are now trying to reproduce the words by the action of light transmitted through the negative upon a gelatine film, using that in like manner to the tinfoil in the phonograph. The plate used was an ordinary wet negative.—*Scientific American.*

Correspondence.

ANOTHER COMPLAINT.

Dear Sir,—Having observed your correspondent's letter, "A Complaint from India," I am prompted also to complain of the want of promptitude in England. If ever I require an article by return of post, even when special mention is made for its immediate arrival, I can expect to look out for it in three or four days hence, and particularly so if the money has been sent. This kind of treatment having worried me many times, I had determined to provide against it; but even now it sometimes happens that a thing is required immediately—on a tour in the country, for instance—when it is exceedingly annoying to have to stay about one place and lose time because some London firm has not paid attention to one's order: and in many other instances it is very vexatious. Some of my professional friends have also made the same complaint to me. A thoroughly reliable firm is much needed who will undertake to execute orders by return of post; and other goods expected by rail should not take more than two days to have arrived at its destination from the time of posting the order—not three weeks and a month, as is generally the case. Will some reliable firm make themselves known who will make a speciality of promptitude, as such would be a great boon to photographers?—Yours truly, J. H. L

PRIZES AT THE DUNDEE EXHIBITION.

Sir,—Your correspondent, J. Hutchison Simpson, whilst warmly congratulating the Association on the liberality of their prize list, takes exception to one clause, that of the award to genre pictures. I quite agree with him in his advocacy of this beautiful and artistic class of photography; but, in taking a catholic view of the likely competitors, let me ask him how the medals could have been better awarded, or, rather, distributed, in the prize list by the Dundee Council?—I am, dear sir, yours respectfully,

Charles Johnson, Hon. Sec.

INTENSIFYING THIN GELATINE PLATES.

Dear Sir,—I was just going to write you my experience in intensifying thin gelatine plates, when I received the News in which Captain Abney describes his process for utilizing this kind of plate. As my method presents some differences from that of our celebrated *confrère*, I may as well fufil my intention, and describe my method, which may prove useful to other fellow-complainers.

Having lately received plates which gave only very thin negatives, notwithstanding a long treatment in the developer, I tried to intensify them (after fixing) with mercury. That was but of little service, the layer of gelatine being too thin, and the blacks of the image remaining transparent. The idea then struck me to treat a plate intensified in such a manner, a second time with the pyrogallic intensifier (pyrogallic acid, acetic acid, and solution of nitrate of silver 3 per cent. in water). This being done, the plate showed no greater intensity. I then washed it again under the tap, and plunged it a second time into the mercuric bath for a few seconds only; then washed it again, and flowed it with liquid ammonia of 10 per cent. strength, to which was added some glycerine. The result was a clear, and dense negative, the blacks acquiring a brownish tint, equal to that of a collodion film. In fact, the plates so intensified retain all over that very slight brownish dye due to the oxidation of the pyrogallic acid referred to by Captain Abney; but that does no harm when one wants only a few proofs of the same *cliché*, as is the case with an amateur like myself, who is not hurried with the printing.

I succeeded quite as well in treating the film, after it had been fixed,—1st, with the pyrogallol intensifier; 2nd, washing it with pure water; 3rd, flowing it with bichloride of mercury and ammonia.

I think we have now in this method a mode quite certain of obtaining negatives of the required opacity, and which will allow the use of any thin plates.

Allow me a few lines more of your space for allusion to another matter. The *frilling* question has been much discussed in the News of late. When that defect begins to show on my plates, I stop it instantly by flowing the plate with pure alcohol. I shall send you in a few days several proofs obtained from plates treated as above described.—Yours truly, A. Eggis,

Directeur de la Revue "Le Monde de la Science."

MR. WARNERKE'S DISCOVERY.

Sir,—May I ask Mr. Warnerke, through your columns, if it is his intention to manufacture and offer to the public sensitive gelatine tissue.—Yours faithfully,

A Would-be Purchaser.

HAS PHOTOGRAPHY COME TO THIS?

Sir,—Allow me to quote from the daily papers and a monthly magazine. The latter—the *Artist*, by-the-way, for this month—says: "In a recent London trial a photograph was produced, and a witness asked, 'Is that the respondent?' The answer was, 'I have no doubt it's him, and it isn't like him.' That is, perhaps, what many people feel when they look at their friends' photographs." Now for the newspapers: "A photograph of Lefroy was shown to witness, who remarked that it was much liker the person suspected than Lefroy himself." Once more, but this is a personal observation: A friend was "twitting" a professional retoucher, and asked him, "What would he do with a lady's turned-up nose?" "Straighten it, to be sure!" was the ready and shameless answer. Is there any wonder, then, that modern photography is losing its honest name by this retouching practice? If honest men don't step in, photographic truth will soon be a bye-word of derision. Don't think I am one of those disappointed men who can't handle the pencil—quite the reverse; photography—wonderful and beautiful photography—has raised me "from the ranks," and enables me to snap my fingers at the world, if needs be. And as for my pencil, the walls of national exhibitions of art have displayed scores of works both in oil and water colour within the last half-dozen years. What I and all artists abominate beyond measure is a photograph showing that the whole face of the sitter has been completely covered by pencilling on the negative.—Yours, &c., J. P. W.

Proceedings of Societies.

Photographic Society of Great Britain.

The first Technical meeting was held on Tuesday, May 24th, 1881, at the Gallery, 5a, Pall Mall, East; T. Sebastian Davis, F.C.S., Vice-President, in the chair.

The Chairman stated the reasons which had led to a trial of these informal meetings, and, after a few further remarks, a discussion was opened by

Mr. Peek, who inquired whether, when bichloride of mercury was used for intensifying negatives, some other body might not be found which would counteract those defects which attended its use?

Mr. Bedford and Mr. York both concurred that mercury should not be used for intensification, and the discussion gradually turned on other methods of intensification.

Mr. Warnerke stated that the bromide of copper intensification did not answer in his hands.

The Chairman expressed his view of the great desirability of maintaining a distinction between the intensification of correctly exposed and over-exposed plates, suggesting the possibility of the effect of light creating a chemical reduction of silver salts of two distinct characters intermediate between silver bromide and metallic silver. It would be desirable to know whether the intensification of negatives by the methods under the consideration of the meeting was assumed to have received a proper exposure, or to be over-exposed.

As regards intensification by means of silver, it was stated that the character of the emulsion seemed to influence the result in a great measure.

Messrs Berkeley, Peek, and Cowan then introduced the subject of the cause of red fog on gelatine plates. It was stated that the quantity of developing solution had no bearing on its production.

A statement was made by Mr. Cobb, which is worthy of attention—that a plate which had what is known as "green fog" gave the best results in printing.

The discussion next turned upon the best mode of developing a gelatine plate.

Mr. Spiller said that, in his view, it was better to begin with pyrogallic acid alone, without washing the plate.

Mr. S. Fry stated that he had had the opportunity of asking 500 photographers as to which method of development was most in favour, and that without doubt Edwards' glycerine developer was the favourite. This, he thought, virtually put ferrous oxalate out of the running.

Mr. Cobb expressed his idea that the glycerine developer was unstable; and Mr. England stated that he had given up using it, owing to having found it of no advantage.

Mr. Mawdsley concurred in this.

Mr. York advocated the use of three times the quantity of bromide to the developer to that usually employed. The general consensus of opinion was that each make of plate required its own formula, and that the less pyrogallic acid used the longer the development of a plate would take.

The question next arose as to the discolouration of the film, and whether it was advisable or necessary to wash a gelatine plate before it was immersed in the fixing bath. The meeting appeared divided in opinion as to this, and the Chairman proposed that the question should be discussed at the next Technical meeting.

Mr. Cobb showed a model of his apparatus for levelling plates during coating, and claimed for it the advantage, that the long stage so generally used was thus done away with. The apparatus met with general approval.

After a few remarks by Mr. Warnerke on his new process, which will be found in the Transactions of the 14th instant, the meeting was closed.

Thursday Evenings for Photographers.

At the meeting on Thursday last, June 30th, Mr. Archer Clarke in the chair, the following letter from Mr. T. G. Whaite was read, but, as Mr. Jarman was not present, discussion thereon, and also the discussion on Mr. Jarman's lamp, adjourned from the last meeting, was adjourned.

"As I cannot be with you next meeting, I drop you a few thoughts on Jarman's lamp, as I understood the discussion would be resumed. The objection to 'lamps' in photo-lighting is the difficulty in managing them when not perpendicular. The angle at which the light and reflector are used must be varied so often, according to the effect desired by operator. No lamp I have tried yet equals the simple carbons in metal holders to which are attached the negative and positive wires, the lower one simply being brought into contact by a cord and pulley, and separated to such a distance as to produce the arc desired. If Mr. Jarman could arrange three such arcs as the one he exhibited on Thursday—say on a small triangle—I think then he would give as good and sufficient light as the best dynamo machine. As the sitter must be lighted by double reflection, it will not be found objectionable having three suns illuminating. What number of cells would be required for these? The objection would be to the filling and emptying these. The set-off would be—costly dynamo machine, costly gas engine, and man to attend both; and they require such, whatever the makers may say to the contrary. I should like to ask Mr. Jarman if such triangular arrangement could not be made. I would place them behind a triangular opaque shield, and bring all carbon points together with a cord. The reflector should be an ellipse suspended to a revolving beam, and capable of being moved to any height or angle."

The real business of the evening, viz., an "Exhibition of Lamps for Photographic Purposes," was then commenced.

Lamps were exhibited and explained by Messrs. Prestwich, Clarke, Marion, Edwards, Henderson, and others.

Mr. Henderson exhibited a lamp which he had constructed so as to be able to pass the light through various coloured solutions; the chimney was enclosed within two glass reservoirs. He stated that if he put a solution of bichloride of platinum and iodide of potassium in one reservoir, he got a tolerably safe light; but that if, in addition to this, he put in the other a weak solution of acetate of copper, he obtained no light at all. He had experimented with many other solutions, but none of them gave a reliable light.

In the course of a most interesting discussion which ensued,—

Mr. Harrison said he thought that if the light was placed behind two or three thicknesses of ruby glass, and the operator was four or five feet away from it, he might work in safety however strong the light might be, as light decreases as the square of the distance.

Mr. Cowan said he found that a sheet of aurine paper placed over a gas jet gave a light safe enough for developing.

Mr. Henderson said that some time ago he placed a small sponge lamp behind a white glass chemist's show-bottle filled with clean water, and exposed a plate at a distance of nine feet from it, and the plate was not fogged so much as another exposed for the same time a few inches from a ruby lamp.

The Chairman exhibited one of "Hardt's Patent Adjustable Pipe Elbows," which he had found very useful in ventilating drying cupboards, &c.

Mr. Cowan said that on developing a plate from a batch made the previous day he had obtained a fine specimen of green fog. He then developed another from the same batch, using only half the quantity of ammonia and double quantity of bromide, and obtained a good negative perfectly clear in the shadows; he then tried plates from other batches with the same results.

Mr. Henderson had found that if in developing one batch of plates he put the ammonia and bromide on before the pyrogallic, he obtained green fog; but on trying another batch the result was quite reversed.

At the request of Mr. Cowan and others, Mr. Henderson promised at the next meeting to demonstrate his method of mixing a solution of nitrate of silver with one of ammonium nitrate of silver without obtaining precipitate.

A vote of thanks to the Chairman, proposed by Mr. Read, and seconded by Mr. Ashman, terminated the proceedings.

Liverpool Amateur Photographic Association.

The monthly meeting of this Association was held at the Free Public Library, William Brown Street, on Thursday, the 30th ult., Mr. W. H. Kirkby, President, in the chair. The minutes of the May meeting were read and confirmed.

The Secretary gave his report of the last out-door meeting of the Association as follows:—On Thursday, June 1st, the Society's excursion took place, the country selected for the purpose being a considerable portion of the county of Salop, from Albrighton to Wellington, *via* Boscobel, White Ladies' Abbey, Tong, and Lilleshall Abbey. The Great Western Railway Company kindly gave orders that the 8.10 a.m. express should stop at Albrighton to deposit the members of the party. Accordingly, at 11.40, at Albrighton, a transfer took place from the train to a roomy drag with good horses, which conveyed the excursionists to the quaint old mansion at Boscobel. This house, with its oak, is associated for all time with the escape of Charles II. from the clutches of his pursuers after the battle of Worcester. Many pictures were taken here, and then the party took up their carriages for White Ladies' Abbey. The only disappointment of the day occurred here; for the Abbey proved to be a most unsatisfactory subject, and almost devoid of photographic interest, one Norman doorway, with a good and somewhat peculiar moulding around the arch, supplying the only subject for a picture. A pleasant drive of a few miles brought the photographers to the Bell, at Tong, where the landlord had provided a substantial dinner. Tong Church, inside and out, proved such an attractive object for the camera that none of the party cared to look for further subjects in the park or about the moated Castle. The interior of Tong is interesting, from the fact that it is supposed to have been the subject of Cattermole's original sketch in the first edition of the *Old Curiosity Shop*, where little Nell and her grandfather are depicted in a quaint old chantry, among richly-carved tombs, with recumbent figures of mailed knights resting upon canopied alabaster. After a lengthy and very enjoyable stay at Tong, during which full justice was done to the ruins at the west end, with the pretty foreground traversed by a water-lilied pool, a drive of about an hour brought the party to the splendid ruin of Lilleshall Abbey. Subjects for pictures were very abundant here, and all were unanimous in their appreciation of the many beauties of the venerable old sanctuary. The best negatives were obtained from the south door—a splendid specimen of late decorated Norman; the east end, with its grand window and ruined mullions; the interior, looking east; and the west front, pierced by a richly-carved Norman doorway. From Lilleshall the drive was continued to Wellington, where the 4.40 p.m. train took up the party and carried them to Shrewsbury for tea, where they enjoyed a pleasant stroll in the town and by the Severn. Notwithstanding the extent of ground traversed and the number of places visited, Liverpool was safely reached at a comparatively early hour, and a most pleasant excursion was brought to a satisfactory close.

Mr. J. H. T. Ellerbeck proposed, and Mr. W. H. Wilson seconded, the following resolution:—That after paragraph 8 in the rules which regulate the competitions, the following words be inserted:—"Not necessarily one of those previously named for competition." After some discussion, the addition received the sanction of the meeting.

The Rev. H. J. Palmer passed round a print of a negative, the subject being a steamer in motion. He mentioned that the picture had been taken from the deck of a moving steamer. The shutter used was his own cardboard contrivance described at the July meeting, 1879.

A discussion ensued on the proposed excursion for July. Denbigh, Chirk, and Ruabon were proposed, and the choice of the meeting fell upon Ruabon, the date fixed being Thursday, July 14th.

The Rev. H. J. Palmer then read a paper on "Remedies for Frilling" (see page 320).

The Chairman exhibited some specimens of frilled films, and notably one in which collodion had been applied unsuccessfully.

Mr. A. Beer had found Epsom salts in weak solution exceedingly useful up to a certain point. It had not, however, completely obviated the evil.

Questions were addressed to the Secretary by Messrs. Ellerbeck, Corkhill, Twigge, Kenyon, Beer, Boothroyd, and Kirkby.

The Rev. H. J. Palmer, in reply, stated that the water employed was of the purest character; that its temperature was that of cold spring water; that plates of several makers had been tried at the same time, and developed with the same developer, and under the same conditions, the frilling occurring only with plates of that one batch; and, finally, that the strong solution of magnesia did not appreciably slow the plates, and had been used in the developer.

Dr. Kenyon had found chrome alum a complete cure.

The Chairman had prevented frilling by adding half as much again of gelatine in making the emulsion.

Mr. Ellerbeck read a paper entitled, "A Photographic Trip from Liverpool to Chepstow" (see page 315).

A vote of thanks was unanimously accorded to him for his communication.

Dr. Kenyon described a new portable camera-stand produced by Messrs. Newton and Co.

The Secretary announced that two members of the Society were about to start on an excursion to Switzerland, and would be glad to hear of other gentlemen of the Association who would be willing to join them.

Prints from negatives taken on the Tong excursion were exhibited by Messrs. Corkhill, Forrest, Boothroyd, Kenyon, and the Rev. T. B. Banner.

The meeting was adjourned till Thursday, the 14th inst.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

THE first field meeting was held on the 28th June. Members assembled at the Stephenson Monument at ten, and proceeded westward in two conveyances. At Lintzford a halt was called, and some plates exposed on the bed of the river, below the paper mills; hence they proceeded to Hamsterley Hall, where Mr. Mendelssohn's tent was pitched. Lunch was consumed at leisure, and cameras, from pocket to twelve by ten size, were used from time to time as light served. One or two good "compositions" may be expected.

The party afterwards proceeded to Shotley Bridge, where an excellent high tea was served at the "Commercial." After tea the members took a stroll round the grounds of Shotley Hall, and left for Newcastle about 7.30.

This, the first out-door meeting, was a thorough success, thanks to Mr. Mendelssohn's leadership.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

A SPECIAL general meeting of this Association (of which Lord Strathmore is Patron) was held in Lamb's Hotel on Thusday, June 30th, Mr. JAMES C. COX (President) in the chair.

After the minutes of the last meeting had been read and approved, the following gentlemen were elected members of the Association—viz., Messrs. James Todd, jun., John Stewart, W. Scott, Peter G. Grant, and James M'Ghie.

The PRESIDENT congratulated the Society upon its progress.

After a comparison of the results of the outdoor meeting to the Trossachs on the 16th, a vote of thanks was awarded to the President as host, and Mr. W. D. Valentine (Vice-President) for having kindly selected choice bits of landscape in order to save time.

The weather was unfavourable, but about an hour was afforded from 10 to 11 A.M. for exposing plates at near objects, and an excellent luncheon was provided by the President at Inver-Trossachs House. The return journey was enlivened by many pleasing incidents. It was decided to hold the general holiday at the Tower of Kinnaird on the 21st inst., when the first bronze medal of the Society will be awarded for the best photograph produced on the occasion.

◆

Talk in the Studio.

PHOTOGRAPHING THE COMET.—As we stated last week, Dr. Huggins successfully photographed the spectrum of the comet on the second night of its appearance. According to *Nature*, both Prof. Henry Draper, of New York, and M. Janssen, of Paris, have also depicted the new arrival by means of the camera. A telegram from America says:—"Prof. Henry Draper has photographed the comet. To obtain such a photograph as he would like, he said, the plate ought to be exposed for at least an hour, but he had succeeded in getting an exposure of only seventeen minutes. The result, however, was satisfactory, in so far that it demonstrated the possibilities of photographing a comet. It showed the nucleus and the coma, and part of the tail. He will try again to obtain a longer exposure. He wishes to take a larger photograph if possible, to examine more carefully the structure of the tail; but the larger the photograph, the more difficult it is to obtain, owing to the diffusion of the light. If he succeeds in obtaining two good photographs, he will next turn his attention to its spectrum, which is much more difficult to photograph than the orb itself." From Paris comes the following news:—M. Janssen has presented to the Academy of Sciences, at its sitting of June 27, the *cliche* of a photogram of the comet, which was taken with the large telescope he described a few weeks ago, constructed for the purpose of astral photography. He obtained also a series of photograms of the nucleus, for which he varied the time of exposure. The results prove that the brightness is not more than that of a star of the fifth magnitude. On the photograph, which will be printed in *Nature*, and which our correspondent has examined, the stars are visible through the tail. M. Faye delivered a speech praising the success realised by his colleague, and remarking that it was the first time that a comet had been photographed.

◆

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER AND CARTER, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER AND CARTER, *and crossed* "*Union Bank, Photographic News Co. Account.*"

⁂ A cheque for two guineas will be given for the best "Reception Room Notes; on Receiving the Sitter and Taking an Order," to be sent in by the 1st August. No name need appear. For rules, see previous numbers of the NEWS.

⁂ We regret that an unusual press of matter compels us to postpone the "In and Out" until next week.

J. H. L.—We are not aware of the existence of any such registry; the usual medium of communication being advertisements.

J. H. PORTER.—1. Most probably the precipitate consists, as you suppose, principally of carbonate of silver and albumen. You had better keep it until you have more residual silver compounds, and then reduce by fusion with carbonate of soda. 2. A lens of the symmetrical or rapid rectilinear type, and having a focus of 11 or 12 inches, will be suitable.

G. M.—1. A somewhat thicker film will probably give a better result. The plate having been levelled, pour on the mixture at the rate of about half a dram for each square inch of surface. 2. About twenty minutes. 3. Do not apply the ink while the plate is too wet.

W. H.—43, Charterhouse Square, London.

MORRIS VAISSIER.—You will find the information you require in our advertisement columns.

T. G. TAYLOR.—What you refer to is the specification of a patent, and we fear that you will have a difficulty in obtaining further details. There are, however, numerous processes of a similar nature which have been described in the NEWS and in the YEAR-BOOKS. 2. This will be treated of in the NEWS shortly.

PUZZLED.—1. Try the formula given on page 200 of our YEAR-BOOK for the present year. 2. It has become partially oxidized, and, as the value is small, it would be advisable to reject it and obtain a fresh supply.

LITTLE NEMO.—Your studio is evidently very well adapted for the production of good work. It would be advisable for you to so arrange the curtains as to render it easy to block out any or the whole of the top light, and to provide one curtain large enough to cover about half of the front sashes. But this curtain must be so placed as to be easily removed, or folded into a smaller compass. In any case, you must try to produce an arrangement of light which shall be suitable to the peculiarities of the sitter; and you would do well to obtain a few artistically lighted specimens, and strive to so arrange matters as to imitate them. In the case of the mounted specimen, too much light comes from the top; and sheets of white paper should have been used to throw more light on the lower part of the figure. The face of the standing subject is far too flatly and uniformly lighted.

ZETA.—We are under the impression that the name in question has been advertised in connection with dry plates, but we cannot be certain.

E. G. N.—1. You will probably obtain more brilliant prints by making use of a stronger sensitizing bath, and allowing the paper to float for a shorter time. 2. A thinner and more highly albumenised paper would prove more suitable for your work. 3. It is not likely to be due to the circumstances you mention. 4. No doubt the vendor would change it for another kind.

EDWIN OBORNE.—Thank you; if we have any enquiries we will forward the information.

A. G. (Plymouth), and E. F. F.—We have written to the firm to enquire.

A. R. M.—The only gentleman who can give you information on the subject is now in India.

AMATEUR.—You have probably failed to obtain the neutral oxalate of potash, the salt usually kept by druggists being an acid salt.

F. P. G.—Thank you for the article; it shall appear in an early number.

CLARA.—The picture has faded, and no means with which we are acquainted will restore it.

F. H.—One part potassic bichromate, two parts sulphuric acid, and twenty parts of water.

T. V.—It can be obtained in a state of sufficient purity at any oil and colour shop.

W. HALLETT.—One of the best forms of magnesium lamp is manufactured by Solomon, of 22, Red Lion Square.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1196.—*July* 15, 1881.

CONTENTS.

PAGE
About Portrait Lenses 325
Excess of Silver Nitrate in Gelatine Emulsion 326
Note on Instantaneous Shutters. By the Earl of Rosse, F.R.S 326
Developing Memoranda 327
Photography In and Out of the Studio 327
By-the-Bye—On "Taking-in" the Editor 328
Notes 329
Topics of the Day—Landscape Studies. By H. P. Robinson 330
French Correspondence. By Leon Vidal 331
Composite Portraiture. By Francis Galton, F.R.S. 332
On the Treatment of Silver Residues. By J. Sorrensen, State Architect, Brunswick 333
Correspondence 334
Proceedings of Societies 335
Talk in the Studio 336
To Correspondents 336

ABOUT PORTRAIT LENSES.

One of our correspondents asks why he may not use his portrait lens for general subjects, landscapes, &c. This is a very pertinent question, and one which is not sufficiently answered in saying that, in using a portrait lens, an unnecessarily expensive article is being used, without advantage being taken of those properties which have rendered it expensive.

If we consider the different objects for which portrait and landscape lenses were designed, and the manner in which opticians have set about fulfilling these objects, we shall soon see sufficient reason why we cannot expect the former to fulfil the requirements of the latter. What is required of a landscape lens, whether it be in the form of a single lens, or that known as a rectilinear, is, that it should give absolutely sharp definition in different planes, all at some distance from the lens, and that it should be able to cover a considerable angle. These two requirements of necessity include flat view of field.

In portraiture, on the other hand, the angle included need not be more than one-half or one-third that required in landscape work. Nay, not only is it not requisite to use a large angle, but it is not advisable, the effect of so doing being that, when the resulting picture is viewed from the usual distance, those parts of the sitter which were nearest the camera appear much exaggerated. Again, absolute flatness of field is unnecessary, as in a portrait all that is of importance is confined, more or less, to the central part of the plate. Nor is the same excessively sharp definition which is considered requisite in a landscape desirable in a portrait; but such sharpness as there, is must be in several planes near the camera.

Seeing that so much latitude was given to the optician in these particulars mentioned, he was enabled to concentrate his attention on what was, before the introduction of rapid plates, considered the great requirement of the portrait lens, namely, rapidity, and to this latter he, to a certain extent, sacrificed every other quality which is considered good in a lens.

The form of the portrait lens is probably known to all our readers. There is a front combination of the meniscus or plano-convex form, very similar to a single view lens, and exhibiting, if used alone, with full aperture, the same excessive spherical aberration that is usual with a single lens. To correct this spherical aberration another combination is placed at some distance behind the first. This latter combination possesses negative aberration, that is to say, it is so formed that the rays which pass through the edge, focus at a greater distance from the lens than those which pass through the centre. By this means a large pencil of light is brought to a focus on any part of the plate near the centre.

The spherical aberration is not entirely corrected, as the effect of doing so would be to have one plane in intensely sharp definition, whilst all others would be, in comparison with this, out of focus. The effect of the slight amount of spherical aberration allowed to exist in the portrait lens is, so to speak, to spread the definition over a certain depth; whilst it prevents any plane from being absolutely sharp. In one of the more modern forms of portrait lens, the spherical aberation is adjustable, and can be altered to suit different subjects.

We have often been asked why it is that the *fuzziness* produced when a lens is used out of focus is so different in effect from the *softness* produced by a certain amount of aberration. The reason is, that in the former case no part of the image is sharp, while in the latter case the image may be considered to be made up of an ill-defined image superimposed on a sharply defined one; or, more correctly speaking, it consists of an indefinite number of superposed images, varying from a certain amount of undefinedness to absolute sharpness.

A little consideration will show at once that it would be quite unreasonable to expect such a lens as that we have just described to do general landscape work; and, as a practical fact, it will be found that, used with stops of the same diameter, the definition which it gives is worse than that given by any form of view lens of the same focal length, and this especially at the margin of the plate, whilst the angle is exceedingly limited, and the illumination very unequal. That these latter two defects must exist, will be evident, merely from considering the form of the portrait lens—namely, that of a tube generally somewhat larger than its diameter. It is evident that, if we leave out of account altogether the bending of the rays as they pass into and out of the lens, the disc which can be illuminated through such a tube must be comparatively small.

Yet another reason why the portrait lens is the least perfect of any, is to be found in the great number of reflecting surfaces of glass which it contains, and their very large size. At every surface of glass that light has to pass through, a certain quantity of it is diffused in all directions, whilst every surface of glass in a lens also reflects back into the camera a reflection of the image on the sensitive plate, the amount of this reflection being proportionate to the area of the surface.

The result of all this is that the greater the number of surfaces in a lens, and the larger their size, the less vigorous the image will be. In the portrait lens the number is usually six, and their size very large. In the Petzval form, moreover, the greater part of the light reflected back into the camera is concentrated upon the central portion of the plate, thereby causing the well-known "flare" or central spot of fog.

Besides all this, the portrait lens distorts to a degree not much less than the single view lens, so that even were the angle great enough, it could not be used for architectural subjects.

To those who wish one lens to do duty both for portrait and landscape work, our advice is to purchase either a "universal" lens, or a rapid rectilinear or symmetrical.

The former may be said to be half-way between the portrait lens and the landscape, or architectural lens pure and simple, as exampled in the single lens, the symmetrical, and the wide-angle rectilinear. They are quite rapid enough for portraiture with the modern gelatine plates, whilst their definition is exquisite; the lighting, very fairly equal from the centre to the margin of the plate; and the angle included, if not equal to that of slower lenses, is at least sufficient for artistic effects in landscape work. They are particularly suited for architectural work, on account of their giving absolutely no distortion; there is no need of introducing diffusion of focus, as the comparatively small aperture provides the necessary depth. In fact, we hope, before long, to see the portrait lens entirely superseded by lenses of one or other of the above types. We have always considered the portrait lens to be more or less of a makeshift, necessitated only by the comparative slowness of collodion, to be given up when a more sensitive medium was found.

Whilst writing of the inapplicability of the portrait lens for landscape and general work, we have been supposing this lens to be used complete, that is, with both combinations in place; but, by removing the back combination, and fixing the front combination in its place, a wonderfully good landscape lens may be made. This plan is, however, very wisely deprecated by opticians, who, naturally enough, do not wish their instruments touched by inexperienced hands. The diaphragm may be used in the usual diaphragm slit; although, as a rule, this is somewhat nearer the lens than should be. The aperture must not exceed one-twentieth of the focal length. We have lately seen some instantaneous views of the Thames, taken on whole plates, with the front combination of one of Ross' quarter-plate portrait lenses, and they left nothing to be desired. The focus of this single lens was nine inches, so that the angle covered was considerable.

◆

EXCESS OF SILVER NITRATE IN GELATINE EMULSION.

It will, we feel, be of advantage to our readers to draw their attention to the subject of gelatine emulsions containing silver nitrate in excess, although by many it may be thought to be out of date—if, indeed, it has not entirely dropped out of mind. It is not, however, so very long ago, that Prof. Vogel pointed out that his collodio-gelatine emulsion would bear the addition of a notable quantity of silver nitrate without the production of red fog; and not only so, but by this addition the sensitiveness of his emulsion was increased at least one and a-half times. He found also that this increase of sensitiveness was soon lost again, so much so, that at the end of twenty-four hours the emulsion had gone back to its original state of sensitiveness.

But in the case of ordinary gelatine plates, the presence of free silver nitrate has a marked effect in reducing the length of exposure, provided only that the salt be not allowed to act for too long a time on the sensitive film. Stosch adopted the following plan:—He mixed 1 or 2 parts of a solution of silver nitrate in water (1 : 15), with 10 parts of ammonia and 100 parts of water; in this mixture the dry gelatine plates when finished were bathed for from three to four minutes, and after being taken out were found to dry in five minutes at most. A plate prepared in this way is, after desiccation, from four to five times as sensitive as one which has not been submitted to the bath, and at the end of an hour shows very little sign of alteration; though if kept for a longer time it will begin to decompose.

We have successfully repeated these experiments with pure bromide, as well as with iodo-bromide gelatine plates and have found that a very dilute solution of silver nitrate, without any ammonia, considerably heightens the sensitiveness. This successful result may be obtained, both with the alkaline pyrogallic, and the ferrous oxalate developer. If the silver solution be too strong, red fog will appear in developing, and the same occurs when the silver solution dries unequally; great care must, therefore, be taken to secure cleanliness.

The question now arises—how is it that this effective action of silver nitrate has only recently been observed? Why have our experiments until now always given bad results when silver nitrate was added to the emulsion? In all the text-books it is stated that, if there be an excess of silver nitrate in the emulsion, red fog will be produced. And this statement is perfectly correct, for if, in the preparation of silver bromide emulsion, superabundant silver be present, and the emulsion be then heated and flowed over the plates, these, when dried, will be found to be bad. The reason is, that gelatine in water, when heated, decomposes the silver nitrate, so that the sensitizing substance becomes inactive, and, what is more, the decomposed salt itself has an injurious effect.

For this reason Gaudin, who, in 1861, prepared an iodo-bromide emulsion with an excess of silver nitrate, failed in getting a good result; Maddox, who, in 1871, was the first to produce gelatino-bromide of silver in the modern form, also made the mistake of adding too much nitrate. These attempts had the effect at a later date of giving currency to the dogma that gelatino-bromide must be prepared with an excess of bromide.

But at the present day we have come to the conclusion that substances which in large quantities have an injurious effect on gelatino-bromide of silver, may, under certain circumstances, be of great advantage. This, as we know, is true for hyposulphite in the oxalate developer, and now, as we see, for silver nitrate in the gelatino-bromide emulsion.

◆

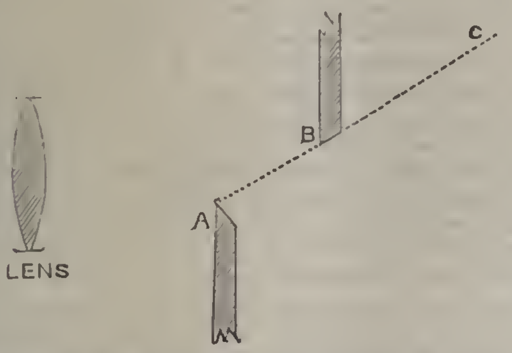
NOTE ON INSTANTANEOUS SHUTTERS.

BY THE EARL OF ROSSE, F.R.S.

Although the designs for instantaneous shutters which have been brought before the public are very numerous—so much so as to lead one to suppose that it is impossible for a new one to be proposed—I venture to suggest a slight modification which appears to me to be free from a defect generally attributed to the simple form of drop-slide such as is sold by Messrs. Watson and Son, of Holborn.

I find that it is very generally said, with regard to drop-slides in front of the lens, that, owing to the acceleration of the velocity of the slide in falling, the exposure given to the foreground of the picture is shorter than that given to the sky and to the upper portions of the picture, which usually require the shorter exposure; and it has been sought to substitute for this drop-slide one at the opposite side of the lens inside of the camera, at a great sacrifice of simplicity. Now if, in Watson's drop-slide, we replace the upper jaw of the opening (which lies in the same plane with the lower jaw A and that of the slide), by one (B) advanced forward from the lens, the opening will have an increasing apparent breadth, as seen from the centre of the lens, from the top, towards the bottom of the picture, and thus an approximate correction, or even over-correction, to the variation of exposure through acceleration may be obtained. If we take the particular case where the relative position of the jaws is such that the opening is apparently just closed, as seen from the centre of the lens at the starting point of the slide, the apparent breadth of the opening will increase directly as the distance moved; on the other hand, the velocity is, as before, as the square root of the distance moved, and consequently the exposure increases instead of diminishes, in proportion to the square root of that distance. Hence, by this simple modification of the drop-slide, the defect commonly attributed to it would appear to be at once removed.

An increase or diminution of the exposure over the whole plate, preserving at the same time the relative exposure of the parts unchanged, may, of course, be given by advancing B along the line A B C, towards C or A, and a variation in the relative exposures upon the several parts of the plate by moving the jaw (B) forward or backward in a direction perpendicular to the plane of the slide, so that the exposure of the centre of the picture may remain unchanged.



With reference to the risk of a slight motion being imparted to the camera by a drop-slide rigidly connected with it, I may remark that there will undoubtedly be a tendency for the front of the camera to rise when relieved of the weight of the slide, on being set free by a trigger or catch; but if the slide be held up at its starting point free of all stops, by a thread held between the fingers or otherwise, independent of the camera, no appreciable disturbance need arise when the exposure is given by the releasing or cutting of the thread.

◆

DEVELOPING MEMORANDA.

Mr. J. H. Regnier, of Liège, publishes in the *Photographisches Archiv* the following extracts from his notebook; as they have passed the test of approval in practice, we make no apology in reproducing them for the benefit of our readers.

1. The following alkaline developing solution is very easy to prepare, and can be used with great facility:—

Potassium bromide...	1 gramme
Strong ammonia	8 cub. cents.
Water	16 ,,

The solution will keep for a long time without undergoing change.

To develop a half-plate mix 6 drops of this solution with 50 cub. cents. of water. When the plate has been well wetted with this, pour the rest of the solution into a glass in which 0·1 to 0·15 gramme of dry pyrogallic acid has been put. If necessary we can commence with less pyrogallic acid, and add more as required.

2. In order to get a softer and more harmonious negative, ammonium bromide may be substituted for potassium bromide, or half the quantity of each salt may be taken.

3. Alkaline developer by Clavier, of Sétif (Algeria):—

A.—Strong ammonia	100 cub. cents.
Ammonium iodide	0·4 gramme

When the weather is hot, more of the iodide should be used; if the Sirocco prevails, as much as 2 grammes

B.—Ammonium bromide	0·2 gramme
Water	100 cub. cents.

Take as much water as will cover the plate, and pour it into a dish with a few drops of B. While the plate is soaking in this, prepare (for a half-plate) the following mixture:—

Water	40 cub. cents.
Pyrogallic acid	0·2 gramme
Solution A	1 to 2 drops.

The image develops in from five to ten minutes, according to the required degree of intensity.

4. Fixing solution and intensifying solution combined (Kennett):—

Dissolve 100 grammes of hyposulphite in 300 cub. cents. of water, and 100 grammes of ferrous sulphate in 300 cub. cents. of water: mix the two solutions, and let the plate, after developing and thoroughly washing it, remain in the mixture until it is sufficiently vigorous.

5. A solution of pyrogallic acid with citric acid (the ordinary intensifier for wet collodion) will also intensify a plate developed with ferrous oxalate, without any addition of silver.

6. Intensifying with pyrogallic acid and silver (Jarman):—

The plate, when fixed, is well washed, and laid in an alum bath; it is again washed and placed in a mixture of 8 cub. cents. alcohol with 120 cub. cents. water; then washed for the third time, and the following solution flowed over it:—

Water	100 cub. cents.
Potassium iodide	2 grammes
Iodine...	1 gramme

In this way all red fog is avoided, but the whole of the manipulation must be carried on in the dark room.

A negative which, by this means, has had all the hyposulphite removed from it, is washed and intensified in the usual way. For this purpose two solutions are required.

P.—Pyrogallic acid	4 grammes
Citric acid	5 ,,
Water	360 cub. cents.
S.—Silver nitrate	5 grammes
Water	100 cub. cents.

The strongest chemically pure nitric acid will also be required. To intensify a quarter-plate, mix together—

Solution P	8 cub. cents.
Nitric acid...	2 drops
Solution S	6 ,,

As has already been observed, all this must be effected in the dark-room.

7. After fixing the negatives, it is well to lay them in a three to four per cent. solution of alum. This prevents them from frilling, even if they have been washed in rain instead of spring water.

8. A bath of a two to four per cent. solution of tannin, used before developing with the alkaline developer (not with the ferrous oxalate developer) prevents the film from frilling. The addition of a little alcohol to the fixing bath, as well as to the developer, also prevents frilling.

9. To remove fog and yellow spots from negatives that have been developed with ammonia, place the negatives in a saturated solution of alum, for from a half to a whole hour—or even for longer. They will become somewhat thinner, and will not have so brown a colour.

10. Yellow turbidity is sometimes produced when the alkaline developer is used. This may be removed by plunging the plates into a solution of boric acid and alum; also by adding ferrous sulphate to the hyposulphite bath.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photography in Burmah—Lady Photographers—Ferrotypes—Photographs on Birthday Cards.

Photography in Burmah.—Photography in Burmah would seem to be as difficult to practise with safety as diplomacy. Some time ago the queen had a fancy for having her portrait taken, and as there was no court photographer, two Armenian ladies attached to the Royal household were despatched to Calcutta for the purpose of learning the mysteries of the art. On their return, the queen was all impatience to have her ebony countenance transferred to paper, and a sitting took place, the result of which the lady-photographers declared was perfectly satisfactory. But when their production was handed to her Majesty they were woefully undeceived, for the royal sitter burst into an appalling fit of rage, and threatened the unlucky photographers with execution. It perhaps might be imagined that the cause of Her Majesty's displeasure was, that she had not been sufficiently flattered; but this was not the case. It seems that during the sitting one of the queen's poodles waddled into the room and took up a position by the side of its royal mistress, and the lens, being no respecter of persons, had of course photographed the dog as well as the lady. Such an insult could only be washed out in blood, and as in Burmah decapitation is considered a very small matter, and not worth thinking twice about, the offending ladies were immediately committed to prison, and probably have by this time expiated their offence.

Lady Photographers.—The too successful results of these Armenian ladies suggest that photography might in England, if not in Burmah, be practised in the studio by women to a far larger extent than it is. The work of the late Mrs. Cameron and of Mrs. Payne (who carried off a medal at the Photographic Exhibition of 1879) are sufficient evidence that photography lies well within the scope of the fair sex. The objection which no doubt many would make, that photography is "nasty, black, messy work," can now scarcely be said to have any force, since gelatine plates have changed all that. We know an instance where a lady photographer was a *sine qua non*, though the circumstances which gave rise to the request are perhaps hardly of that importance to cause ladies to rush in and insist upon becoming photographers. In this instance, a proud mamma was desirous of having a baby of some six months old photographed with "noding on," and in pursuance of her fancy sent to several photographic studios, but never succeeded, because she never could find one where the operator was a lady. Whether the idea of having the baby photographed *in puris naturalibus* by a *man* was too much for her modesty, or whether she had scruples about shocking the modesty of the photographer, we cannot say. Such extreme sensitiveness cannot, however, be said to exist to that amount as to make a lady photographer in every studio an absolute necessity, and we would not advise too much stress to be laid upon the incident. We are inclined to think, also, that either ladies' dresses in their feminine essentials would have to be modified, or dark rooms considerably altered, if fair photographers are to succeed. As most photographers know, ingenuity has been exhausted in the endeavour to make dark rooms as inconvenient as possible. We know one attached to a large and well-appointed studio where the door is so narrow that no one save those of the Sarah Bernhardt type of anatomy could possibly enter. Others are so small that skirts would inevitably be in the way, and nothing but some variation of the Dr. Mary Walker costume would enable the operator to work with anything like comfort. There are not a few dark rooms, too, which can only be approached by lifting up a trap door in the floor of the studio, and descending a ladder, as if one were going into a ship's hold. Then—and this, we fear, is an insuperable difficulty—would ladies like to be photographed by ladies? If there is one place in the world where human vanity peeps out, it is in the photographic studio. The innumerable little artifices, prompted by this weakness, to secure re-sittings and to furnish reasons why the photographer has failed, are plaguing enough to the masculine photographer, but he generally is able to regard them with sufficient philosophy to prevent them seriously disturbing his peace of mind. But if ladies knew they had to deal with a lady, it is possible they would hesitate before sitting to her, knowing they would be speedily found out. Of course our lady photographer might be compensated by a preponderance of patronage from the opposite sex, but as the proportion of lady to gentlemen sitters is at least three to one, there is not so much advantage as might at first be supposed. On the other hand, the novelty of having one's photograph taken by a lady might stimulate that lukewarm interest which most gentlemen feel in the matter. At all events, the experiment is worth trying.

Ferrotypes.—M. Leon Vidal's recently-published suggestions as to an improved method of producing ferrotypes are worthy of remark by all photographers who contemplate taking up the process. But there is also another point which must not be lost sight of. In most cases it will be found that the introduction of the ferrotype in its "gem" form brings with it a lower class of customer, and materially alters the character of a business. A photographer who has a connection which brings him fair prices runs a risk of losing it by going in for "gems." The latter are produced at a very low price, and, as in many other things, it is the quantity that pays; therefore, unless a photographer has facilities for taking a large number of sitters, he will not find the business remunerative. Of course, if he finds that the low-priced "gem" pays him better and gives him less trouble than the high priced connection, he can afford to let the connection go. But this, of course, can only be decided by experiment, and if the experiment turn out unsuccessful, the result may be disastrous. We should be inclined to think that a photographer is only likely to make the "gems" pay when his studio is situated in a busy thoroughfare, where he gets plenty of publicity, and where there is a fair chance of a succession of new people. To introduce "gems" in a business which is carried on in a quiet suburban thoroughfare would seem to court failure. Naturally, in the present depressed state of photography, when a man finds his connection is building itself up very slowly, he is tempted to add something which may increase his returns. There is not the slightest objection to his trying to do this by taking "gems" at the rate of 7½ for nine, but before doing so we should counsel that the matter be well weighed on the points we have referred to.

Photographs on Birthday Cards.—There are signs that photography will play an important part in the production of Easter, Christmas, and Birthday Cards. Already, on the last-named, many of the charming pictures of Mr Payne Jennings are making their appearance, and the fact suggests a means of using up old stereo negatives of which our landscape photographers must have thousands stored away. The interchange of cards between relatives and friends, accompanied by the photograph of a place well known to both, seems to be an idea which might be well worked out. Cheapness of production, of course, is the essential quality, but to secure this an economical mechanical printing process is still wanting. Perhaps Mr. Willis's platinotype process might answer the purpose.

By-the-Bye.

ON "TAKING IN" THE EDITOR.

It is capital sport, and so easily done; at any rate, so some people think. Of course, we can only be expected to write about the few instances in which the attempt was so feeble, or the hook so badly baited, that deception was at once apparent. We are naturally reticent concerning the many glaring examples of weakness in which our tormentors have been successful; and, though we pen these words neither in sorrow nor in anger, we cannot but deem ourselves justified in making use of such abortive enterprises for the theme of an occasional paper.

It was the budget of moonlight photographs that reached us during the winter that first put the notion of writing this paper into our head. We grew quite ashamed of ourselves, that some of our correspondents should hold our brains so cheap. One picture we have still was forwarded as a marvellous example of the sensitiveness of gelatino-bromide—a fine ruin taken by the light of the moon. There are several columns, and in the shadow of one of them stands a man, whose garments are actually to be made out. Marvellous as was the gelatine plate, the moonlight itself was obviously more wonderful still, and it was because no stress was laid upon this by our correspondent, that we did not refer to the picture in print. "Honour where honour is due," we thought, so said nothing about it. Another moonlight picture of the sea forwarded to us actually showed the shape of a crisp wave; in this case, the correspondent was very brief, for he had simply written, "What do you think of this?" If we did not reply, it was for the simple reason that we did not like to say what we thought.

We pass on. "Do not print this letter; but you may put it in one of your interesting Notes"; the "it" in question relates, of course, to something which the writer prefers us to father, rather than himself, and a flattering adjective is thrown in as a little sop. Strange to say, the self-denying requests of this kind that come to us—and they are neither few nor infrequent—are always marked by two peculiarities: they never contain any fact or invention of general interest, and they always have reference to the writer's well-being in one way or another.

Here is another very harmless little example. "I was at Slocum-cum-Pogis the other night, and heard a gentleman perform most exquisitely upon the jews harp; I asked his name, and found it to be Snookes. Will you kindly say in your Answers to Correspondents whether he is the same well-known Mr. Snookes who is such a distinguished photographer?"

Sometimes a note comes to the Editor, which he finds, on opening, has been addressed to him, by mistake, instead of to the publisher. It contains a request to stop an advertisement which has been running during three whole weeks, and also a regret that the Editor has failed hitherto to dwell in a leader on the efficacy of the method advertised of wiring on the collodion film to prevent it slipping from the glass—a plan recommended as a capital substitute for preliminary coatings. There is a small N.B. at the bottom of the note, which says that if the Editor gives the required notice, the advertisement need not then be stopped. To write a lengthy complimentary notice is naturally enough the first thing to be done, and the consequence is, that the advertisement retains its place in our columns, and all goes on merrily as a marriage bell. But it must be acknowledged that if every advertiser became suddenly sly and knowing, there would be nothing but puffs in the News.

We have got used to the cobbler's dictum that there is nothing like leather, and we ought to bear with equanimity assertions of a similar nature. Still we do think that some of our correspondents harp a little too much upon the circumstance, and upon the way of making leather. The treatment of gelatine with tanning material—whether it be skins subjected to the action of oak bark, or sensitive bromide under the influence of alum—is a matter just now of the first importance with the photographer, as it is with the leather manufacturer; still our readers, we feel sure, are already fully convinced of the fact, and require little assurance from those who repeat the circumstance in connection with commercial and scientific matters with which they are closely connected.

Another plausible way of getting a hearing is to contradict without contradicting. The Editor is easily taken in under these circumstances. A statement appears to the effect that one of these days we may have a developer which will develop collodion plates as rapidly as gelatine; straightway a correspondent writes firmly and distinctly asserting that there is no developer extant which will do such a thing. He fearlessly challenges any one to do with collodion what he can do with his gelatine plates. The science of contradicting is well known on the daily press, where it is practised with considerable ingenuity, both in the leader columns and in correspondence; but it only reaches the highest state of perfection, as everybody knows, in the political world.

Here is a cutting from the *Times*, a middle slice from the very best part of the paper. It gives a long account of a fashionable studio, and deserves to be quoted, for the type is leaded and made much of. In fact, it is sent us to quote, so we shall copy it into the "News" as it stands. What a good notice it is, and in such a wonderful part of the paper, too; the open type begins at the top of the column, and it is back to back with a leader. The only thing about this cutting is, that it is a little too good—it is so excellently displayed, as advertisers say. Stay, let us examine the date. "The Times, Tues" is at the top (it is a middle column, we have said), and turning to look at the back, we find again "The Times, Tues". We do not know what strikes us as quaint in this, but somehow it does seem strange, and we turn to a copy of the *Times* by our side for comparison. Here we find that the heading is not the same, back and front, as in our cutting. If "The Times, Tues" were at the top of a column, there should be at the back, "day, the 4th Nov," or something of the sort. So we look again at the type in our cutting, and we see it has been set and printed off with much more care than the *Times* usually is. So, in the end, we put the cutting on one side; the description may or may not, once upon a time, have appeared in the leading London paper—we do not care to enquire; but of one thing we are certain, that the cutting sent us was never cut from the *Times* newspaper.

The "At Home" next week will be "Mr. Marshall Wane at George Street, Edinburgh; the following "By-the-Bye" will be "With the Camera on the Continent."

Notes.

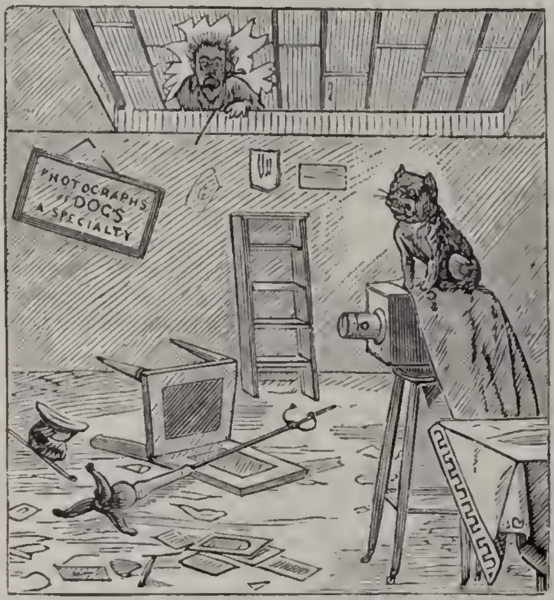
At the last meeting of the *Académie*, MM. Cros et Carpentier exhibited some tinted photographs in which the colours were produced by superposing layers of coagulated albumen containing pigments. M. Edmond Becquerel very properly pointed out that the specimens were not immediate photographic reproductions of objects in their natural colours, but were due to a polychrome manipulation of the negative, the tints varying at will, according to the pigments used. It is a pity an explanation of this kind does not accompany every published account of photographs in colour!

We have been favoured with a note from "the Autocrat of the Breakfast Table," in which he refers to the suggestion in these columns to make practical trial of his idea of photographing the trees of America and Great Britain—trees being just as indicative of country and climate as are the races of mankind. "Accept my thanks for your polite attention. I have received your very pleasant letter, which was followed by the Photographic News. You may be sure," continues the genial American poet, "that I found the passages in which I was agreeably reminded of myself." Threescore years and ten passed some time since over the head of Dr. Oliver Wendell Holmes, and it is pleasant, indeed, to find he still takes a lively interest in contemporary literature.

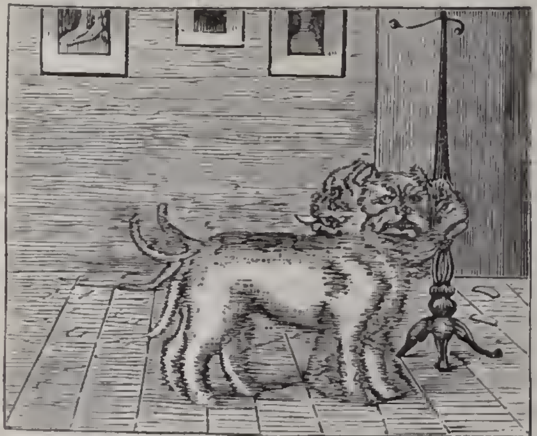
King's College is developing into a Polytechnic School. Photography has long been included in the course of instruction, and now there appear to be workshops established for imparting all sorts of technical teaching. Mr. A. Bisset Thom sends us a set of photographs of cups in various woods, turned by himself and other students, productions recently exhibited at the conversazione.

The point in connection with drop shutters which the Earl of Rosse raises in our columns certainly deserves attention. He proposes to compensate for the increase of rapidity with which a shutter falls, during the latter part of its flight, by advancing one jaw of the shutter before the other, and in this way controlling to any desired degree the respective exposure of sky and foreground.

"No dogs admitted!" seems, after all, a very wise precaution in the studio. We clip from *Harper's Bazaar* the result of two attempts to photograph a prize bull-dog. Here is attempt No. 1.


PHOTOGRAPHS OF DOGS A SPECIALTY

In No. 2 we have an illustration of human intelligence triumphing over brute force. But here the result, although the dog has been made fast, is one in which the photographer would scarcely feel pride.



Captain Elsdale, R.E., an experienced military æronaut, is busily occupied at Gibraltar with balloon photography. He does not ascend with the camera, but proceeds something after the manner of Mr. Woodbury; the camera is attached to a small captive balloon, and the exposures are made from the earth by means of an electric wire. Strange to say, with all our recent knowledge, no one has succeeded so well as Nadar in depicting the earth from the sky. The Paris photographer's pictures taken at the time of the siege are still unrivalled.

Germany has hitherto depended for safety against the forgery of its bank-notes upon a notice printed in microscopic words across the note, which, on careful examination, tells you that you will be given penal servitude for life if you counterfeit the document. But photography having made microscopic printing comparatively easy, the Great Fatherland has to resort to a plan for discomfiting photographic forgers. This is effectually done by adopting a paper invented in America, which is streaked at intervals with coloured fibre. The tinted fibre, being embedded in the paper, cannot be removed, and any attempt at bleaching alters the whole surface, while the photographer is equally puzzled to reproduce the parti-coloured document as it stands.

That Wilcox's paper—for so the material is called—is practically proof against forgery, may be inferred from the circumstance that, ingenious as our American brethren are, there has been no successful attempt to counterfeit dollar notes during the past ten years. The Prussian Government have consequently determined upon employing the same paper in their bank-note printing-offices.

Topics of the Day.

LANDSCAPE STUDIES.

BY H. P. ROBINSON.

No. 4.—Sunshine.

It is the unalterable belief of those whom Shakespeare calls "the general," that the sun takes the picture, a tradition that must have arisen in the early time when photographs were sometimes called sun-pictures, and well deserved the name, for, indeed, in those days the sun had a good deal to do with the operation. The experimental photographer thought nothing of placing his sitter in the full blaze of the sun for five or ten minutes, and if the victim escaped without having his face whitewashed, he was lucky. It was then thought very astonishing that a portrait could be taken in a few minutes, instead of having to give many sittings of long duration to a painter. Improvements in the art have come upon us so gradually that in talking of it we are apt to say, "No, there is nothing fresh—nothing particularly new has been discovered," &c.; but if we compare the ill-defined smudge of forty years ago, that required minutes—in some cases, hours—to produce, with the highly elaborate, delicate, and finished result we now get, and that with an exposure made with a flying shutter, because the hand is not quick enough, who shall say we have not advanced? But this is beginning with a digression. Let us get into the sunlight.

A few days ago, looking over a dealer's stock, I came to a photograph that quite surprised me. It was of rather lage size, about 11 by 7, mounted as a panel on thick board, with gilt edges. It represented a scene in the Highlands—Loch Katrine and the Trossachs, I think, the famous scene described in the "Lady of the Lake." The composition, and light and shade, were quite admirable; but what struck one most was the almost perfect expression of sunshine in it. It absolutely glowed with sunlight! I do not know the name of the photographer. I was about to ask for it when I was told the price of this lovely print was one and fourpence! And I felt a sort of instinctive delicacy in asking the name of a man who had the ability to produce such beautiful work and sell it for a few pence. I preferred to think it the production of one of those indifferent photographers who sometimes meet with an accidental success, and trade it off at so much per cent.

profit on the materials used, like a baker or a tailor. This little incident set me thinking on the subject, and I came to the conclusion that, although a large majority of out-door photographs are taken in sunlight, very few of them really represent the "merry sunshine," or what has been still more admirably called, "Nature's smile."

There is no doubt that to represent sunshine quite completely, colour is necessary; but the effect of sunlight can be very well suggested without its aid. Turner is famous chiefly for his colour, but careful study of his works will reveal the perfect subordination of colour to light and shade. This is shown in the fact that all his pictures engrave well. Ruskin, who always preaches colour, in one of his earlier works has shown that colour is not indispensably necessary to the adequate representation of all the phenomena of nature, especially sunshine. Turner, as usual, is his theme. "I have before shown the inferiority and unimportance in nature of colour, as a truth, compared with light and shade. That inferiority is maintained and asserted by all really great works of colour; but most by Turner's, as their colour is most intense. Whatever brilliancy he may choose to assume, is subject to an inviolable law of chiaroscuro, from which there is no appeal. No richness nor depth of tint is considered of value enough to atone for the loss of one particle of arranged light. No brilliancy of hue is permitted to interfere with the depth of a determined shadow. And hence it is that engravings from works far less splendid in colour are often vapid and cold, because the little colour employed has not been rightly based in light and shade. Powerful and captivating and faithful as his colour is, it is the least important of all his excellencies, because it is the least important feature in nature. Were it necessary, rather than lose one line of his forms, or one ray of his sunshine, he would, I apprehend, be content to paint in black and white to the end of his life."

How is it, then, that photographs so seldom represent sunlight, when a great artist like Turner would rather give up his colour than lose the sunshine he could always get in black and white? I suspect it is that we do not give the massing of the light and shade in our pictures sufficient thought. A quantity of flashes and spots of light scattered over the picture will never suggest anything but spots of light; but if a breadth of sunlight can be contrasted with a breadth of shade, but of unequal quantity, sunlight will be suggested, especially if the composition of the view allows of distinct and vivid cast shadows.

There is another effect of sunlight that has never been well given in a photograph—I mean the effect of passing clouds over a sunlit landscape. To render this effectively, the view must be somewhat extensive, and the exposure short. There should be no near foreground, especially of leaves or other objects that would be affected by wind, for the best effects of this kind are accompanied with strong breezes. These subjects are, I know, quite possible. A few weeks ago I got a capital example of it in North Wales, but the negative was spoiled as a picture by the movement of an ash tree which came rather large in the foreground, and was destroyed at once. I have also found the shadows of clouds on the sea to come very perfectly. In connection with the destroyed negative to which I have just alluded, I may mention that I find it a good plan, when a negative has some radical defect in it, to destroy it at once. If you stop to think, you will persuade yourself to keep, and perhaps print and exhibit, a picture which never should have passed the development stage of existence.

To help photographers to feel how beautiful sunlight really is, I will venture to give a rather long, but most picturesque quotation from Ruskin's "Modern Painters," a book now almost out of the reach of the ordinary reader. "There is not a stone, not a leaf, not a cloud, over which light is not felt to be actually passing and palpitating before our eyes. There is the motion, the actual wave and radiation of the darted beam; not the dull universal daylight, which falls on the landscape without life, or direction, or speculation, equal on all things, and dead on all things; but the breathing, animated, exulting light, which feels, and receives, and rejoices, and acts—which chooses one thing, and rejects another—which seeks, and finds, and loses again, leaping from rock to rock, from leaf to leaf, from wave to wave, glowing, or flashing, or scintillating, according to what it strikes; or, in its holier moods, absorbing and enfolding all things in the deep fulness of its repose, and then again losing itself in bewilderment, and doubt, and dimness—or perishing and passing away, entangled in drifting mist, or melted into melancholy air, but still—kindling or declining, sparkling or serene,—it is the living light, which breathes in its deepest, most entranced rest, which sleeps, but never dies."

The "Topic" next week will be "How I Retouch and Varnish my Gelatine Negatives."

◆

FRENCH CORRESPONDENCE.

Meeting of the Photographic Society of France—Development of Gelatine Negatives with Carbonate of Ammonia—M. Stebbing's Sensitive Pellicle—New Works on Photography—Museum of Photography in Connection with the Conservatoire des Arts et Metiers—Examination of Photographic Assistants for Certificates.

Meeting of the Photographic Society of France.—The last meeting of the Photographic Society of France was not very largely attended, partly on account of the heat, partly because many of the members have left Paris. There was absolutely nothing of interest on the agenda list, as no one seemed to care to bring anything forward before so meagre an audience. It therefore fell to my lot, although without any great merit, to make a communication respecting my researches on the action of various sources of light, of the same illuminating power, as measured by my selenium photometer. As I have already described this in my last letter, it is scarcely necessary for me to repeat it now.

Development of Gelatine Negatives with Carbonate of Ammonia.—In the course of this meeting, M. Balaguy described his developer for gelatino-bromide plates. He always employs the carbonate, instead of liquid ammonia. By this means he is able to completely control the gradual appearance of the image; and he succeeds in obtaining very intense negatives, in the thickness itself of the gelatine film. The following is his formula:—

A.—Carbonate of ammonia	50 gr.
Water	1,000 ,,

To this solution he adds from 3 to 6 gr. of ammonium bromide—3 when the plates are made with recently prepared emulsion, 6 when the emulsion is a little old.

B.—Pyrogallic acid	15 gr.
Alcohol	250 ,,

He puts 2 or 3 cub. cents. of the solution B into 100 cub. cents. of A, and if the print to be developed has had a very rapid exposure, he plunges the plate into this mixture. If, on the other hand, the plate has been exposed for some time, he dips it first into A alone, dropping on it afterwards, gradually, some drops of B, so as to make the development take place slowly.

M. Stebbing's Sensitive Pellicle.—M. Stebbing exhibited at the meeting some of his gelatino-bromide pellicle, which in point of excellence seems to leave nothing to be desired. When it is used, it must be mounted on some strong support, to which it is made to adhere during the whole of the subsequent manipulation. He showed also some remarkable prints taken by M. Baresme, photographer, of Paris, on gelatine plates made in his own laboratory.

New Works on Photography.—Two new photographic works were laid upon the table at the meeting. The first of these is a "Manual of Manipulation with Carbon Tissue and Transfer Paper," by M. A. Lamy. This is, in fact, a complete treatise on carbon printing, full of minute details, described with great clearness by a very skilful operator, whose advice, the fruit of a long and active experience, deserves not only to be listened to, but to be taken. The treatise will, perhaps, be of more use to the amateur than to the professional photographer, as the work of the latter has to be executed more quickly and on a larger scale than that described by M. Lamy; but for amateur work, the description of the arrangement of the laboratories, and the great attention paid to minute precautions, render the book a very valuable one. Such a practical manual as this cannot fail to develop the employment of the carbon process. The second work is a treatise "On the Woodbury Process," by M. Léon Vidal, published by M. Gauthier-Villars. Concerning my own work I naturally can say nothing, except that a book of the kind was greatly needed. My desire has been to meet a want, and also to popularize acquaintance with a method of printing too little known, and up to the present too little practised. The recent improvements introduced by Mr. Woodbury will have a powerful effect in promoting my efforts. This said, I can only submit my work to the kind appreciation of the public, to whom the rôle of critic naturally belongs.

Museum of Photography in connection with the Conservatoire des Arts et Metiers.—A photographic museum is just now in course of being established at the *Conservatoire des Arts et Metiers.* M. Hervé-Mangon, the director of this well-known institution, has selected specimens of all the different processes which are deserving of notice. A special court has been set apart for them, where they will be exhibited, each with a label describing the nature of the process and the name of the inventor. This is a very happy idea, and by means of it photography will find a place in all our museums and collections. I cannot praise too highly attempts of the kind, and I hope that this special museum will be methodically arranged, and will continue to be made more complete by the addition of new processes as they make their appearance.

Examination of Photographic Assistants for Certificates.—The project of establishing a technical school for photographic operators, which had been entertained by the *Chambre Syndicale de Photographie*, has been abandoned, so many difficulties were found in realizing it. The hope of ultimately attaining the object in view, however, has not been entirely given up, and a commencement will be made by holding examinations of photographic assistants. Those who pass these examinations will receive certificates of different degrees. Candidates of any nationality will be admitted to the examinations, and the plan itself is so far organized that it will soon be published. I can hardly foretell what measure of success this project will meet with, but at any rate we can say that it can do no harm, even should it not be able to do good. It certainly deserves to be carried out as far as possible, for if it should be successful, it would provide professional photographers with assistants whom they can trust as knowing something of their art, and the best of whom will no doubt find places in the principal photographic establishments. Leon Vidal.

COMPOSITE PORTRAITURE.

BY FRANCIS GALTON, F.R.S.*

For convenience in enlarging or reducing, I take care that the intersection of the vertical fiducial line with that which passes through the pupils of the eyes shall correspond to the optical axis of the camera. Then, as I enlarge or reduce, that point in the image remains fixed. The uppermost horizontal fiducial line continues to intersect the pupils, and the vertical one continues to divide the face symmetrically. The mouth has alone to be watched. When the mouth is adjusted to the lower fiducial line, the scale is exact. It is a great help having to attend to no more than one varying element. The only inconvenience is that the image does not lie in the best position on the plate when the point between the eyes occupies its centre. This is easily remedied by using a larger back with a suitable inner frame. I have a more elaborate contrivance in my apparatus to produce the same result, which I need not stop to explain.

For success and speed in making composites, the apparatus should be solidly made, chiefly of metal, and all the adjustments ought to work smoothly and accurately. Good composites cannot be made without very careful adjustment in scale and position. An off-hand way of working produces nothing but failures.

I will first exhibit a very simple but instructive composite effect. I drew on a square card a circle of about 2½ inches in diameter, and two cross lines through its centre, cutting one another at right angles. Round each of the four points, 90° apart, where the cross cuts the circle, I drew small circles of the size of wafers, and gummed upon each a disc of different tint. Finally, I made a single black dot half-way between two of the arms of the cross. I then made a composite of the four positions of the card, as it was placed successively with each of its sides downwards. The result is a photograph having a sharply-defined cross surrounded by four discs of precisely uniform tint, and between each pair of arms of the cross there is a very faint dot. This photograph shows many things. The fact of its being a composite is shown by the four faint dots. The equality of the successive periods of exposure is shown by the equal tint of the four dots. The accuracy of adjustment is shown by the sharpness of the cross being as great in the composite as in the original card. We see the smallness of the effect produced by any trait, such as the dot, when it appears in the same place in only one of the components; if this effect be so small in a series of only four components, it would certainly be imperceptible in a much larger series. Thirdly, the uniformity of resulting tint in the composite wafer is quite irrespective of the order of exposure. Let us call the four component wafers A, B, C, D, respectively, and the four composite wafers 1, 2, 3, 4; then we see, by the diagram, that the order of exposure has differed in each case.

Composite.		Successive Places of the Components.							
1	2	A	B	D	A.	C	D	B	C
4	3	D	C	C	B	B	A	A	D

In 1 it has been A, D, C, B,
„ 2 „ B, A, D, C,
„ 3 „ C, B, A, D.
„ 4 „ D, C, B, A.

Yet the result is identical. Therefore the order of exposure has no effect on the result.

I will next show a series consisting of two portraits considerably unlike to one another, and yet not so very discordant as to refuse to conform, and of two intermediate composites. In making one of the composites I gave two-thirds of the total time of exposure to the first portrait, and one-third to the second portrait. In making the other composite, I did the converse. It will be seen how good is the result in both cases, and how the likeness of the longest-exposed portrait always predominates.

The next is a series of four composites. The first consists of fifty-seven hospital patients, suffering under one or other of the many forms of consumption. I may say that, with the aid of Dr. Mahomed, I am endeavouring to utilize this process to elicit the physiognomy of disease. The composite I now show is what I call a hotch-potch composite; its use is to form a standard whence deviations towards any particular sub-type may be conveniently gauged. It will be observed that the face is strongly marked, and that it is quite idealised. I claim for composite portraiture, that it affords a method of obtaining *pictorial averages*, which effects simultaneously for every point in a picture what a method of numerical averages would do for each point in the picture separately. It gives, in short, the average tint of every unit of area in the picture, measured from the fiducial line as co-ordinates. Now every statistician knows, by experience, that numerical averages usually begin to agree pretty fairly when we deal with even twenty or thirty cases. Therefore we should expect to find that any groups of twenty or thirty men of the same class would yield composites bearing a considerable likeness to one another. In proof that this is the case, I exhibit three other composites—the one is made from the first twenty-eight portraits of the fifty-seven, the second from the last twenty-seven, and the third is made from thirty-six portraits taken indiscriminately out of the fifty-seven. It will be observed that all the four composites are closely alike.

---

* Continued from page 317.

I will now show a few typical portraits I selected out of eighty-two male portraits of a different series of consumptive male patients; they were those that had more or less of a particular wan look that I wished to elicit. The selected cases were about eighteen in number, and from these I took twelve, rejecting about six as having some marked peculiarity that did not conform well with the remaining twelve. The result is a very striking face, thoroughly ideal and artistic, and singularly beautiful. It is, indeed, most notable how beautiful all composites are. Individual peculiarities are all irregularities, and the composite is always regular.

I show a composite of fifteen female faces, also of consumptive patients, that gives somewhat the same aspect of the disease; also two others of only six in each, that have in consequence less of an ideal look, but which are still typical. I have here several other typical faces in my collection of composites; they are all serviceable as illustrations of this memoir; but, medically speaking, they are only provisional results.

It will be asked, of what use can all this be to ordinary photographers, even granting that it may be of scientific value in ethnological research, in inquiries into the physiognomy of disease, and for other special purposes? I think it can be turned to most interesting account in the production of family likenesses. The most unartistic productions of amateur photography do quite as well for making composites as those of the best professional workers, because their blemishes vanish in the blended result. All that amateurs have to do is to take negatives of the various members of their families in precisely the same aspects (I recommend either perfect full-face or perfect profile), and under precisely the same conditions of light and shade, and to send them to a firm provided with proper instrumental appliances to make composites from them. The result is sure to be artistic in expression and flatteringly handsome, and would be very interesting to the members of the family. Young and old, and persons of both sexes, can be conbined into one ideal face. I can well imagine a fashion setting in to have these pictures.

Professional skill might be exercised very effectively in retouching composites. It would be easy to obliterate the ghosts of stray features that are always present when the composite is made from only a few portraits, and it would not be difficult to tone down any irregularity in the features themselves, due to some obtrusive peculiarity in one of the components. A higher order of artistic skill might be well bestowed upon the composites that have been made out of a large number of components. Here the irregularities disappear, the features are perfectly regular and idealised, but the result is dim. It is like a pencil drawing where many attempts have been made to obtain the desired effect: such a drawing is smudged and ineffective; but the artist, under its guidance, draws his final work with clear bold touches, and then he rubs out the smudge. On precisely the same principle the faint but beautifully idealised features of these composites are, I believe, capable of forming the basis of a very high order of artistic work.

ON THE TREATMENT OF SILVER RESIDUES.

BY J. SORRENSEN, STATE ARCHITECT, BRUNSWICK.[*]

There are still many photographers who take very little care to turn to proper account the residues and wash-waters of their studios, and though few will be found who entirely neglect the recovery of the silver from their waste solutions, there are cases where, partly though ignorance, partly from indolence, the silver residues are allowed to pass down the sink. And yet the work of recovering the silver is so simple and easy, that we can only wonder how anyone whose vocation must have made him familiar with chemical manipulations can wish to evade it.

Generally the residue, in the shape of precipitated chloride, is sold to the dealer, and there can be no objection to this method if the precipitate has been separated in a pure state, for the honest dealer can then at once pronounce on its value. But if, as is so often the case, the precipitate consists of a wet and shiny mass of silver chloride, mixed with the dregs of the developing and fixing solutions, and often containing bits of paper and other offscouring of the laboratory, how is it possible for the dealer to form an idea of the value of the pure silver it contains? The separation of such a mixture costs time and money, and must be taken into account. Cleanliness and care are therefore of the greatest importance in any process for collecting the residues.

For the reduction of the pricipitates to metallic silver, the only reliable method is that by fusion. Reduction in the wet way can only be employed in the case of the chloride, and if a special galvanic apparatus is not used, the silver thus obtained is likely to contain impurities, especially zinc; hence it is preferable to resort in every case to fusion. For this process a tolerably large crucible must be used, and the reducing agent must be added in small quantities at intervals, waiting on each occasion until the reaction, which may be recognized by the mass frothing up, is complete. Any ordinary stove in which coke is burnt can be employed for this operation; when it is finished the crucible, after being allowed to grow cold, is broken, and the metallic silver will be found at the bottom in the form of a button.

So far, the manipulation of the silver residues presents no material difficulties, but the subsequent conversion of the metallic silver into the nitrate, especially the operations of evaporating the nitrate solution and the fusion of the resulting salt, are among the most disagreeable proceedings which the photographer has to undertake. The fumes of nitric acid which are given off during the evaporation contain towards the end of the process much nitrate of silver, and, spreading to a great distance, they cover all articles of furniture or other objects in the room with a number of small black spots. When the operator has adopted the bad habit of using his dark room as a laboratory, this visitation may produce incalculable mischief. After all, instead of the accustomed pure white silver nitrate, the operator will perhaps find he has a nasty dark mass, which has an acid reaction, and contains silver nitrite, the source of innumerable failures in the negative process. If, on the other hand, the silver nitrate be allowed to crystallise out without coming to the fusing point, a purer product will be obtained; but for an unpractised chemist it is difficult to free the crystals completely from the mother liquor, much of the silver nitrate remaining in the latter, so that, after all, fusion has to be resorted to. For these reasons it is in every way better for the photographer who is not provided with all the conveniences of a well-furnished chemical laboratory to confine himself to the production of metallic silver, which, as above explained, is not a difficult process; he will get a good price from the dealer, and is quit of the troublesome and noxious operation of reducing the metallic silver to the nitrate.

A point of material importance in this working up of the silver residues is the financial question, inasmuch as the profit is the greater, the greater the quantity of material one has to deal with. Now, in the production of silver nitrate on a large scale, it would be much too costly for the manufacturer to use fine silver only, as well as much too difficult to get this substance in sufficiently large quantities; he is compelled to have recourse to ordinary standard silver containing a certain portion of alloy. For the photographer who has not the necessary convenience and skill, the production of pure silver nitrate from metallic silver alloyed with copper is a work of great difficulty and troublesomeness, and not by any means worth his while. The relation of the price of fine silver to that of the nitrate varies, of course, with the market, but, as a generel rule, is in the proportion of 15 to 12; assuming, therefore, that fine silver can be sold at its full value, we ought to get for each part of fine silver one and a quarter parts of nitrate. On the other hand, by the conversion of one part of fine silver we should get 1·57 parts of nitrate, the advantage, therefore, in conversion over the exchange being about one-third of the weight of the silver employed. Where large quantities can be employed, this advantage becomes of importance, and if it were not for the difficulties and inconveniences above alluded to, the conversion of his own silver into nitrate would be to the photographer a source of considerable profit. Any method, therefore, which does away with the disagreeable operations of converting metallic silver into the nitrate by means of evaporation and fusion will be welcome to the photographer. Such a method the author believes he has discovered; one by which, without trouble or loss of time, a perfectly pure and faultless product can be obtained.

---

[*] *Photographische Mittheilungen.*

By this method the production of the salt in a solid form is avoided, and the silver nitrate is obtained in a solution of which the degree of concentration is known. The quantity of solution which must be produced is easily calculated; a gramme of metallic silver corresponds to 1·57 grammes of the nitrate, so that a solution of the salt of the degree of concentration 1 : 10 contains, for every gramme of silver, 1·57 grammes of nitrate and 15·7 grammes of water. If the solution has a strength of 1 : 8, for every gramme of silver 8 × 1·57 = 12·6 grammes of water are required. Before commencing work, therefore, the metallic silver—obtained as chemically pure silver by the reduction process—must be weighed, and the weight in grammes must then be multiplied by 1·57, and also by the proportional number of the water in the degree of concentration, in order to get the corresponding quantity of solution. For instance, suppose that by the reduction process a button of silver of 136·4 grammes weight has been obtained, and that it is required to have a solution of the strength 1 : 11, the quantity of solution to be produced will be found by multiplying 136·4 × 1·57 × 11, so that the volume of solution must be made up to (nearly) 2,356 cubic centimetres by the addition of distilled water. As we have to do in this process with pure silver solution, we can, if desired, avoid the calculation by using an ordinary silver densimeter, sinking the instrument in the liquid, and adding water (stirring every time) until the required degree of dilution is obtained.

Now, to get a pure solution of silver nitrate, and, above all, one free from all acid, the button of metallic silver must first be dissolved in chemically pure nitric acid diluted with one-third or one-fourth of its volume of distilled water. This is best effected in a porcelain basin, heated over the flame of a gas-burner or spirit lamp, but never allowing the solution to reach boiling point. It is advisable to carry out the operation in the open air, on account of red nitrous acid fumes being given off, which are hurtful to the lungs. Only a small quantity of acid should be used at a time, and so soon as the development of the red vapours has ceased, and the silver salt shows signs of crystallising out, the liquid should be poured off into a glass vessel. Another small quantity of acid is then poured on the silver, and, as before, transferred to the glass beaker, the operation being repeated until the silver has disappeared. By this means not only is the silver dissolved in as short a time as possible, but the solution which has been collected in the beaker contains only the least possible excess of free acid.

We must now endeavour to neutralise this free acid. This is best effected by putting a small portion (about one-fifth) of the acid solution into another glass, and adding to it a solution of pure sodium carbonate, so long as a yellowish white precipate is formed; an excess of the carbonate is not injurious. Stir it up with a glass rod, and add more of the carbonate until the solution has a decided alkaline reaction, by turning red litmus paper blue. Let the precipitate now settle, pour off the superincumbent liquid, and wash several times with distilled water. The precipitate is now for our purpose pure silver carbonate, for even if it contains infinitesimal quantities of sodium nitrate and carbonate, these substances will have no injurious effect on photographic operations.

Now pour the portion of the solution that remained in the beaker on the washed precipitate; carbonic acid gas will be given off with effervescence, and the silver carbonate is dissolved in the excess of nitric acid. If the whole of the carbonate is dissolved, there has not been enough precipitated in the first part of the operation, and the same process must be repeated with another small portion of the original solution. But if the proper proportion has been observed, there will remain a little of the carbonate precipitate still suspended in the liquid: this must be redissolved by carefully dropping in pure nitric acid, and the last trace of excess of that acid must be again neutralised by adding sodium carbonate in very small quantities until a very slight appearance of silver carbonate is produced, which does not vanish on shaking up or stirring the solution.

The solution thus obtained, if the directions above given have been carefully followed, contains nothing but chemically pure silver nitrate; it must be brought to the requisite degree of concentration by adding water as above described, and can now be at once used, if desired, for the positive bath. For the negative bath it must be first iodised and filtered, but no filtration is required in the case of the positive bath. Should the solution be at first too weak (though this is not likely to occur) it can be strengthened by adding a few crystals of silver nitrate. When it is to be kept for future use, it is better to have it in a concentrated condition, and it will be improved by keeping for some time in a warm place, so as to allow any free carbonic acid to escape, which is liable to form bubbles on glass plates and paper.

The author has employed the above described process for several years, and can recommend it for its simplicity and economy. By means of it, not only are the silver residues of the laboratory turned to good account, but a perfectly pure silver bath is produced, of any required strength.

Correspondence.

ANOTHER COMPLAINT.

Sir,—"J. H. L." speaks, apparently, for professionals; but I rather fancy we amateurs are worse off in that respect than any other class, as we frequently, no doubt, do not know what we want till the time for using it comes. At the same time, I think it rather hard to condemn all the dealers at one fell blow, and as an instance to the contrary you will perhaps permit me to say that when, some time back, I wanted to try a particular lens, and wrote to three dealers enquiring for a second-hand one, I got an immediate reply from one of your advertisers; and on writing again they actually obtained it from the makers, and had their names engraved upon it and got it into my hands (200 miles from London) in twenty-six hours (by rail); they have also sent me one or two small matters by return of post. In the case of the lens, however, which was my first transaction with them, I had written twice, and had the lens in my possession a day into the bargain, before I got a reply from the other dealers, one of whom, having the article I wanted in his possession, actually lost the sale of it by his neglect.—Yours truly, Richard Parr.

PRIZES AT THE DUNDEE EXHIBITION.

Sir,—In answer to the Secretary of the Dundee Council, who asks me, "How the medals would have been better distributed?" will you allow me to say that any manner that would have recognized degrees of quality in *genre*, as has been done in the other two branches of landscape and portraiture, would, to my mind, have been a more satisfactory distribution. If it so happens that one great *genre* artist is in the field, and sends his best pictures, he will carry off the single medal, as he may have done scores of times already; while others, who may be coming hard up behind, doing their best, will be left out of all running, discouraged and chagrined. So much is this felt to be a possible aspect of affairs, that I hear several very fine *genre* workers don't intend to run the gauntlet of the Exhibition.

Now, a catholic view of the case leads me to think and say that that is a pity. An exhibitor, I take it, has at least two objects in view—first, the gratification and education of the public tastes; and secondly, the encouragement and distinction of superior merit and skill.

It is always understood that weaklings who promise well should receive probationary support. A thing that has reached healthy, vigorous, self-sustaining life, does not need artificial aid.

That is the relative state of matters with *genre* and portraiture; there is a good public demand for good portraiture; it pays any one to do it; it is, in a measure, self-sustaining. Not so in the *genre*: it does not pay those who practise it, unless to those who love the work; for art's sake, it would not be entered upon by any practising photographer; hence the small number of probable competitors.

That, however, is the very reason why greater encouragement should be given.

I trust, therefore, the Council will yet see their way to supplement their *genre* prize-list, and extend the circle of their patronage more widely round a branch of photography which we all admit to be both "beautiful and artistic."—Yours sincerely, J. Hutchison Simpson.

MR. WARNERKE'S DISCOVERY.

Sir,—In the absence of Mr. Warnerke, who is at present in Russia, I take the liberty to reply to a "Would-be Purchaser," and beg to inform him that very shortly Mr. Warnerke's sensitive gelatine tissue will be in the market.

Permit me also to say that Mr. Warnerke has taken patents for his tissue in England, on the Continent, and in America.—Yours, &c., James Cadett.

PHOTOGRAPHING THE VIBRATIONS OF THE VOICE.

Dear Sir,—Allow me to suggest an improvement in the construction of the ingenious piece of apparatus for effecting the above purpose, described in your columns last week.

This consists in making use of a small lens between the shutter and the sensitive surface to focus the opening, thus abolishing diffused light with the fog complained of, and also securing the fluctuation in the amplitude, as well as the period of the diaphragm's vibration, by photographing the variations in width, &c., of the opening of the shutter, which its motion influences, and without which there could be no reproduction of the voice or other exciting cause by the method proposed.—I am, dear sir, yours faithfully, John Harmer.

PLYMOUTH EXHIBITION.

Sir,—As there seems to be a misunderstanding as to who took first honours at this Exhibition in photography, between Mr. W. J. Byrne, of Richmond, and Mr. H. A. H. Daniel, I would point out that the class was divided into two sections, viz., landscape and portraiture; Mr. Daniel taking the highest in the former, and Mr. Byrne in the latter.—I am, sir, yours faithfully,

T. Martin, *Secretary.*

Proceedings of Societies.

Manchester Photographic Society.

The third out-door meeting of the present season was held on Saturday, July the 2nd, at Dunham Hall. Twenty-three members and friends mustered, and, by the kindness of Robert Platt, Esq., of Dunham Park, they were allowed to visit and photograph in all parts of the Park, and also in the private pleasure grounds, &c.

The day was a very favourable one, and a great many plates were exposed on the fine old trees and other studies.

The Hon. Treasurer (Mr. W. G. Coote) exhibited a few prints from his most recent negatives, and the Hon. Sec. (Mr. W. J. Chadwick) showed some transparencies from his latest work. The next meeting will be to Ashford-on-the-Water, on Saturday, July 16, 1881, from Central Station, at 1 o'clock. This is expected to be one of the finest meetings of the season.

Edinburgh Photographic Society.

On Thursday, the 7th inst., the annual pic-nic of the above Society took place at Gosford, the seat of the Earl of Wemys. The company started from the N.B. Railway station by the 9.20 train for Longniddry, from which station a few minutes' walk brought them into the beautiful grounds, where they were met by Mr. Gelletly, the head gardener, and conducted by him to where tables were erected for their use. After luncheon was discussed, Mr Gelletly conducted them through the grounds, which were greatly admired. Several members having cameras, a number of plates were exposed, and many groups taken. On returning, the company found dinner laid out in a very inviting manner by the purveyor, Mr. John Pringle. After dinner, various toasts were proposed and honoured. The music then struck up, and dancing and games—fun of every description—was the order of the day, until seven o'clock, when a move towards the station was made, and all arrived safely in Edinburgh about nine.

Several valuable prizes, presented by various members of the Society, were awarded to the winners of the games, and carried off by them in triumph.

The weather was all that could be desired, and the pic-nic a decided success.

Thursday Evenings for Photographers.

At the meeting on July 7th (Mr. T. J. Pearsall in the chair) Mr. Brown related his experiences with a small camera which has recently been introduced to the public at the cost of £1 1s.; and exhibited several views taken with the apparatus.

Mr. Henderson gave an account of a camera by which he made his first entrance into the photographic world as an amateur. It was of very primitive construction, consisting for the most part of a cigar box and spectacle lens.

Mr. J. A. Harrison showed and explained a series of small slips of wood which he found very useful, as gauges, in cutting up large size plates in the dark.

Mr. Prestwich said he found that by far the better plan was to cut the glass first, then coat, and dry, and afterwards break it asunder.

Mr. Henderson, called upon to demonstrate his ability to mix a solution of ammonio-nitrate of silver with one of nitrate of silver without giving any precipitate, proceeded to make a solution of nitrate of silver, and another of ammonio-nitrate of silver; this done, he, amid great suspense, proceeded to pour the contents of the one vial into the other, when, lo! the solution remained colourless, the result being received with applause.

The failure of other gentlemen to accomplish this object was in most cases attributed to free ammonia.

Bolton Photographic Society.

The above Society held an out-door meeting at Worsley on Saturday, the 2nd July. This is the first the Society has been able to hold, the weather on the two previous dates fixed having been most unpropitious. There was a good muster of members, and after the afternoon's work was finished, the party, after some slight refreshment, returned to Bolton by the 7 p.m. train, the only notable event during the afternoon being a refusal to allow the party to photograph the Church.

Bristol and West of England Amateur Photographic Association.

The second excursion meeting of this Society for this season was to have taken place on Wednesday, the 6th instant, at Farleigh Castle, the members walking from Freshford through the pretty scenery on the banks of the river.

It was understood that only if fine would the excursion take place, so that no one proceeded by train to Freshford. However, when it was too late for any suitable train to be caught, the weather brightened, and some few of the members met and hastily arranged a ramble down the banks of the Avon. The place of meeting was by the clock tower of the Dock Master's Offices, at the Lock Gates of the Bristol Docks, and towards this spot the various members proceeded either by steam-boat, tram, or rail, and at two o'clock all who were going had assembled.

Having crossed the ferry over the Avon near the Dock Gates, the party turned towards Rownham Fields. From this point a remarkably fine view is obtained of the entrance to the Docks, the Clifton Suspension Bridge, St. Vincent's Rocks, and the river Avon, forming together one of the most grandly-composed subjects of nature and art which could possibly be seen anywhere. Notwithstanding the gusty nature of the wind, it was fortunately a subject in which it made but little difference, as the side of the river which included the foliage was fairly sheltered. A number of plates were here exposed, from 10 by 8 to quarter-plate. More was accomplished than was altogether desirable; for a strong gust of wind coming suddenly, caught one of the cameras (a quarter-plate belonging to Mr. Hughes), and, while the owner's back was turned, threw it and the stand to the ground, considerably dislocating the former. This was quite enough to bear, one would think; but when one of the members was heard to softly breathe something about its being "nothing when you are *used* (Hughes'd) to it," not only the owner of aforesaid camera, but everybody made a grab at their apparatus and bolted precipitately.

At length all managed to pull themselves and their shaken nerves together, and a start was made for a fresh spot. The shock, however, had been too great, and at the "New Inn," it was absolutely necessary that the members should "refit." This seemed to put all things right as if by magic; and a very pleasant walk was taken on the river's bank, leaving the docks on the right, with that portion of the district of Clifton overlooking the river far above.

On passing under the Suspension Bridge one is at once struck with the great height from the river of the position it occupies, and for this reason those who have not seen it before are impressed with it more than by any other suspension bridge. Its great length, coupled with this and the beautiful character of its surroundings, make it one of the most striking engineering successes of the present day. We now come to a bend in the river where a large point of solid rock is being cut off to facilitate the navigation; having continued the walk, a point is reached from which a most picturesque and graceful picture of the Bridge is obtained. On the left the various-coloured sandstone, limestone, and other rocks rise to a height of over three hundred feet, from the top of which the grassy slopes of Durham Down commence. On the right is the rich foliage of Leigh Woods, also a railway tunnel, through which the distance clearly shows; in the middle distance is the Suspension Bridge high in the air, and, lower, a portion of the city and Clifton, with the distant Mendip Hills far in the rear. Close in the foreground are some old broken barges high on a mudbank—a very fine and exceptional composition, which brought the whole battery of cameras into play—even the unfortunate one, the bellows of which was fortunately not damaged. This was the last subject upon which plates were exposed, as, in addition to the light waning, the wind rose considerably, so that the return walk was commenced.

The Hon. Secretary announced that the next meeting would take place at Farleigh, as intended to have been visited that day.

Talk in the Studio.

The Photographic Club.—Members are informed that the Treasurer (Mr. Dunmore) has removed to 28, Oseney Crescent, Camden Road, N.W.

Messrs. Marion & Co. forward us copies of two cabinet pictures made up of vignettes, after the manner of "Good Night," and "Good Morning." One card represents a bevy of bright damsels "happy and careless," and the other a collection of elderly spinsters "cappy and hairless."

The Colour of Black.—When making some experiments under the direction of M. Chevreul, M. Niepce de St. Victor, who tried helio-chromic experiments on a large doll bedecked with jewels and resplendent with coloured silk, made the remarkable discovery that black is not the mere absence of light, but is entitled to be considered a colour of itself, and has a special chemical action of its own. The colour of the sensitive plate was violet, and on this the camera impressed all the colours of the doll, including white; but as the blacks had also been impressed as black, it led to this experiment:—A hollow tube, black from the absence of light, was presented to the camera, together with another article of a definite black colour, with the result that the former was represented by an unaltered state of the original violet colour of the surface, while in the latter case a very deep black resulted.—*Engineer.*

The London Stereoscopic Company have just settled an important action brought by them against a large public Company for producing in coloured lithography a number of their copyright celebrities. The amount paid to them to compromise was understood to be considerable, and with all costs. Had the case gone into Court, the penalties of £10 per pirated copy—the sum specified by the Act—would have exceeded 1,000,000 sterling

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Co. Account."*

*** A cheque for two guineas will be given for the best "Reception Room Notes; on Receiving the Sitter and Taking an Order," to be sent in by the 1st August. No name need appear. For rules, see previous numbers of the News.

How I Retouch and Varnish My Gelatine Negatives.—We shall increase our prize to £3 3s., and divide it between Mr. J. B. Harrison, Mr. W. Shawcross, and Mr. E. A. Maxwell.

J. S. A.—We have passed dry plates through the Customs of most European countries without difficulty; but our plates were small, and done up in packets of six. Twice only we have been challenged—at Copenhagen and at Isella, the station frontier on the Simplon—and here suspicion was allayed when we showed our sub-divided packages. Keep your packets small.

All About Derby.—Received.

J. Harris.—They serve to reduce the aperture of the lens, and the more the aperture is reduced, so much more uniformly sharp will be the picture in all its parts. When you reduce the aperture the amount of light passing through the lens is diminished, and a proportionately long exposure must be given.

Gleaner.—All particulars will be found in the Year-Book under the heading "Societies."

W. D. Jones.—See article by Mr. Blanchard in the Year-Book for 1878.

Tranter.—1. It is a consequence of a too prolonged emulsification. 2. Not more than three grains in ordinary cases. 3. It appears to be better suited for studio work; but carefully compare for yourself. 4. We would advise you to postpone your first attempts in carbon printing until the present hot weather is over.

Countryman.—It appears to us that you have considerably over-exposed in every case. Try several exposures on the same plate by drawing the shutter of the slide about an inch at a time, and uncapping the lens after each change.

Chromate.—1. This phenomenon is simply due to the fact that the temperature of the bichromate solution is so high as to dissolve the gelatinous coating, and you can remedy matters by cooling the liquid with ice, or by adding about one-fourth of its volume of methylated spirit. 2. The granulation or reticulation of the image is especially liable to occur when the tissue is dried at a high temperature, or very rapidly. 3. Markings from several totally different causes correspond to a certain extent with your description; therefore it would be best for you to send us a print.

Captain Tulton.—See Mr. Cadett's letter in this week's news.

A. G. (Plymouth), and E. F. F.—Hutinet, of Paris. Write them.

Black Specks.—It appears that some particles of foreign matter or impurity were floating in the emulsion. Filter carefully through fine muslin (previously boiled in water), and take care that the vessels used are quite free from any remains of previous batches.

Studio.—You will act unwisely if you rely mainly on light so much obstructed by the wall, as you will lose almost all that horizontal illumination which is often essential for the production of a good portrait. Have you a clear way on the south side? If so, glaze this part as well as the north, and provide the necessary blinds for blocking out the light when you do not require it.

K. Martin.—The sample of cardboard contains hyposulphite of soda, and is therefore quite unfit for the purpose.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1194.—*July* 22, 1881.

CONTENTS.

PAGE
Streaks in Gelatine Plates 337
Substrata for Gelatino-Bromide Plates 338
On the Spectrum Impressed on Gelatino-Chloride of Silver Emulsion. By Captain W. de W. Abney, R.E., F.R.S. 338
Increasing the Sensitiveness of Gelatine Plates by Means of Free Silver Nitrate 339
Developing Trays and Lanterns for Tourist Photographers ... 339
Club Sitters. By "Cliff" 339
At Home—Mr. Marshall Wane in George Street, Edinburgh .. 340
Notes 342

PAGE
Topics of the Day—How I Retouch and Varnish My Gelatine Negatives 343
Preparation of Photographic Asphalt. By Dr. R. Kayser 345
Photographs on Woven Fabrics. By Winter and Co., Vienna 345
Exhibition of the Photographic Society of Great Britain 345
Non-Putrescent and Quick-Drying Emulsion 346
Correspondence 346
Proceedings of Societies 347
Talk in the Studio 348
To Correspondents 348

STREAKS IN GELATINE PLATES.

Nearly every week some light is thrown upon a hitherto unintelligible cause of failure in the gelatine process, which, by systematic investigation, as well as by careful observation, has already been placed amongst the most beautiful, and, at the same time, the most certain of photographic processes.

Nevertheless, but few ordinary photographers appear to be in a position to prepare their own plates with the certainty of producing results as good as are obtained from the best commercial plates. True, it is not difficult to obtain both sensitiveness and freedom from fog, if ordinary care is taken, for the conditions necessary to success in these particulars are now comparatively well understood; but still there frequently remains some minor defect, of very obscure origin, which renders absolute perfection so difficult of attainment, that the amateur is often induced to abandon the preparation of his own plates, and, in preference, to adopt the more expensive, but, at the same time, the more certain plan of buying them.

For example, it frequently happens that either spots appear on development, or that light streaks and insensitive patches reveal the fact that the film is not of perfectly homogeneous character throughout. Now it has been shown beyond doubt that a most frequent cause of spots is to be traced to dust and to minute particles of foreign matter, which adhere to the surface of the gelatine film when in a wet condition. For the microscope reveals the fact that nearly all circular spots on gelatine plates have some nucleus in the centre, which has apparently acted as a repulsive agent, preventing the precipitation of silver within the sphere of its influence.

But the origin of streaks and light patches is not so easily traced to any definite cause. The microscope, in this case, fails to detect any apparent difference in the film, and the only conclusion which can be arrived at is, that the particles of silver bromide are in a different molecular condition in various parts of the film. Towards the explanation of one very likely reason for this class of defects, Mr. Warnerke has done good service by his observation of the effects of pressure upon the gelatine film. He observed that, when a number was written in pencil on the back of a sheet of tissue, the pressure thus caused produced, on development, light-coloured marks on the film. He next tried the effect of writing, with an ivory stylus, some words on a gelatine plate. After development, the words appeared light on a dark ground. In fact, it was found that a very slight pressure on the surface was enough to produce a marked diminution of sensitiveness, on account of the compression of the gelatine produced by this means. Now, it is beyond doubt that a large number of streaks and patches upon gelatine negatives has been produced accidentally by some similar process to this. It has been generally believed that when once a gelatine plate has been properly made, it will stand any amount of rough handling, so long as the film is not actually scratched or broken. But this observation of Mr. Warnerke's is sufficient to show that the greatest danger may ensue, even from a slight rubbing of the film. If touched with soiled fingers, it will be readily understood that stains might occur on development; but, hitherto, it has not been generally known that simple contact, even with substances which are chemically clean, may produce most undesirable results.

One simple illustration of the practical application of this discovery will suffice. The tourist who wishes to change his plates, after a day's photography, frequently does so under cover of darkness, and feels the coated side of the glass by passing his finger across it. It is now seen that he will be fortunate if he secures negatives free from some trace of his finger marks. But, probably, in very few cases has any particular care been taken to avoid touching the gelatine; and without doubt many of those hitherto inexplicable streaks and patches which have appeared on negatives, perfect in all other respects, may be ascribed to unintentional compression of the film by accidental pressure. That some spots undoubtedly have this origin is proved by the fact that in some cases an unmistakable, although faint, impression of a genuine finger-mark has appeared on development.

But, apart from the practical importance of the fact that compression of the film produces a local diminution of sensitiveness, this discovery has also an especial interest from a theoretical point of view. Captain Abney long ago expressed an opinion that the greater sensitiveness of bromide of silver in gelatine, compared with collodion emulsion, is not due to any chemical or physical condition of the silver salt, but only to its molecular condition. This theory is borne out by Mr. Warnerke's observations; for he found that expansion of the film, by moistening parts of it with water before exposure, caused increase of sensitiveness.

The true cause of this phenomenon is not perhaps easily explained. Long ago Moser demonstrated the influence of contact upon development. He showed that if a polished surface has been touched in particular parts by anything, it acquires the property of precipitating certain vapours on these spots, in a manner different to the untouched spots. Thus, if a piece of metal having a pattern cut out on it be laid for a few minutes upon a piece of clean glass gently warmed, the glass, when cooled and breathed upon, shows distinctly the outlines of the device. But if so slight a cause is adequate to modify the molecular condition of a rigid surface like glass or metal, it can easily be understood that a flexible film like gelatine will have its molecular arrangement disturbed by even the smallest compression.

In the present case, however, the compression appears to retard the precipitation of the silver by the developing agent, not by causing any repulsive action between the particles, but by a real diminution of sensitiveness; for when the film is touched after exposure, no effect is visible.

◆

SUBSTRATA FOR GELATINO-BROMIDE PLATES.

Probably there is no single source of failure incident to the gelatine emulsion process which has caused so much trouble and disappointment as frilling or blistering. The cause of this phenomenon is simple, and easy of explanation. Under the action of aqueous solutions the gelatinous film tends to expand or swell in all directions, and it would, if not attached to the glass, stretch proportionately as regards superficial area and thickness. When, however, the colloidal film cannot relieve itself from the plate, it expands as regards thickness only, and consequently remains in a state of unequal tension.

It is obvious that the larger the proportion of water absorbed by the film, so much greater is the tendency towards frilling; and various methods of rendering the film less absorbent are in use at the present time. But it must not be forgotten that any hardening of the film tends also to prevent the developer acting with its full effect and normal rapidity. These considerations point to the desirability of meeting the difficulty rather by causing the film to adhere firmly to the glass, than by diminishing its capability of absorbing watery fluids; but, in all cases, it is important to select a suitably firm gelatine, and to take care not to unduly deteriorate it by the prolonged action of heat.

It is interesting to note that one of the earliest expedients for the prevention of blistering or frilling consisted in exposing the edges of the plate to the light, so that these portions should become so little subject to absorb water as to remain firmly seated on the glass. Similarly, we find that Malloek suggests the use of plates having a roughened or ground border; and it has been proposed to paint the edges of the glasses with india-rubber solution. These methods are effectual in some instances, but not always, as true blistering does not start from the edges of the plates like ordinary frilling.

In the case of collotypic printing, one great difficulty is the firm attachment of the gelatinous printing surface to the glass support, and several of those expedients which have long been adopted by the collotypic printer have been found applicable to the gelatino-bromide process; but as the strain on the gelatino-bromide film is so much less than on the collotypic layer, somewhat simpler operations and modified preparations serve. Forrest beats up the albumen from one egg with twenty ounces of water, and adds an ounce of alcohol together with twenty drops of carbolic acid. If this preparation is carefully filtered, and each glass, after being flooded with it, is allowed to remain in a vertical position till dry, there will be little or no fear of blistering or frilling arising with gelatino-bromide films prepared on plates thus albumenised, even though a very soft variety of gelatine be employed in making the emulsion.

A substratum of water glass, or an alkaline silicate, is also very useful. One part of the syrupy silicate of soda is mixed with 200 parts of water, the plates being coated and drained as already described; but we prefer to use a little albumen in conjunction with the silicate—six parts of fresh albumen being beaten up with 120 parts of water, after which 1 part of the silicate of soda is added. This substratum flows better on the glass than the plain silicate, has not the same tendency to produce markings, and holds the film more firmly. There can be no doubt that the silicate substrata actually corrode or etch the surface of the glass, by virtue of the considerable excess of alkali present. In the case of the substratum last mentioned, the plates may be washed after the silicate coating is dry; all the alkali being thus removed, nothing remains but an extremely thin film of albumen, united with finely-divided silica, and this film exercises no action whatever on the most sensitive emulsion.

A substratum of gelatine rendered insoluble by means of chrome alum is preferred by some, and it certainly possesses the advantage of being very little trouble to prepare, and easy to apply to the glass. The following answers well. Two drams of Coignet's gelatine are soaked in six ounces of water, and then dissolved by the action of heat. This having been done, five grains of chrome alum are dissolved in two ounces of water, and added to the gelatinous solution. This preparation must be used while warm, and it is as well to take care that the plates are not so cold as to chill the mixture. Each plate must be flooded, drained, and placed in an approximately horizontal position to dry.

In all cases it is important to take care that the plates to be coated with a substratum are free from every trace of grease; a mixture of equal volumes of strong ammonia and alcohol, applied with a pledget of papier Josef, serves very well as a detergent.

It sometimes happens that it is a matter of importance to save a negative which has either frilled or blistered. In such a case, the best way is to encourage the frilling by prolonged soaking in soft water, and then to gradually loosen the film by side pressure with the finger, the plate remaining under water all the time; when the film has been thus entirely separated from the glass, it can be caught on another and slightly larger plate, and allowed to dry. This operation is extremely easy after a little practice, but the negative becomes enlarged to the extent of about one-third (linear). Of course it can be so placed on the new glass as to form either a direct or a reversed negative.

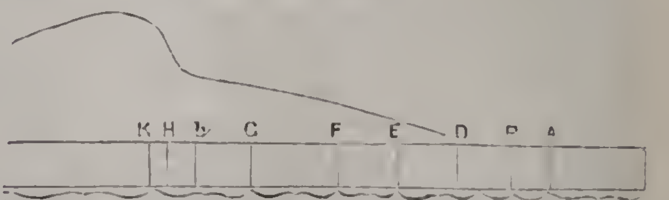
◆

ON THE SPECTRUM IMPRESSED ON GELATINO-CHLORIDE OF SILVER EMULSION.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

I have recently been experimenting with Dr. Eder's gelatino-chloride of silver emulsion, developing with the ferrous citrate, as he recommends. The emulsion was prepared precisely in the same way as that recently described in the News—boiling for half-an-hour with a small quantity of gelatine, or by using ammonia with the silver nitrate. This last plan is, however, impracticable this hot weather. Developing a great many plates has shown me that a mixture of ferrous oxalate, with the ferrous citrate in the proportion of one to three, accelerates development considerably. The developers should be mixed immediately before use. The resulting image is a beautiful black, and very dense, so far as the emulsions with which I have worked are concerned. I must say, however, that I have not found the emulsion quite so slow as Dr. Eder has described. What I wish to call attention to more particularly is the effect of the spectrum on this modified chloride. The maximum intensity is at the extreme limit of the violet end of the visible spectrum, about the line H, and it rapidly falls at the line *h*, and then very gradually falls off to near D, where it terminates.

The annexed figure will explain.



In the ultra-violet the sensitiveness is the same as the energy curve in that region.

It is very remarkable that the blue rays about G have comparatively very little action on the modified chloride, and this is the first case I have noticed in which the sensitiveness of a haloid salt of silver is small in that region. If we can find a more energetic developer than that used, it is quite in the region of possibility that this modified chloride may be useful in such photography as Dr. Huggins is engaged in—viz., in stellar spectrum photography.

◆

INCREASING THE SENSITIVENESS OF GELATINE PLATES BY MEANS OF FREE SILVER NITRATE.

Mr. Stosch, of Lomentz, writes to the *Photographische Mittheilungen* that, by the use of an alcoholic solution of free silver nitrate, he has been successful in making gelatine emulsion (without any admixture of collodion) plates four times as sensitive as the same plates which have not been treated in the same way. The only precaution necessary to be taken is to prevent the silver solution from acting too long on the sensitive film. His method of proceeding is as follows :—

He prepares a solution of 17 grammes of silver nitrate in 250 cub. cents. of water, and adds to it 10 cub. cents. of ammonia, of about three-quarters the strength of that recommended for the Nelson developer with Vogel's emulsion. Of this mixture, from 1 to 2 cub. cents. are dropped into 100 cub. cents. of alcohol of 85 per cent. The gelatine emulsion plates are prepared by Eder's formula, and, having been carefully washed, they are dipped in spirit to remove the water. They are then placed in the above-described alcoholic solution of silver nitrate for three or four minutes. In about five minutes after being taken out of this bath, the film will be found to be quite dry.

To contain the bath, Mr. Stosch recommends a dish of dark coloured glass (one of ebonite, or any similar substance will not do), covered with a ruby frame, but the operation of drying must be carried out in complete darkness ; a double ruby frame in the window will not suffice. He also insists on the use of perfectly new glass plates, carefully cleaned before being coated with the substratum ; if the substratum alone be relied on, spots and fog will be the result. The same effect is seen in the wet process ; when the sensitiveness has been raised to the highest pitch by neutralising, concentrating, heating, &c., only quite new, thoroughly-cleaned plates may be used.

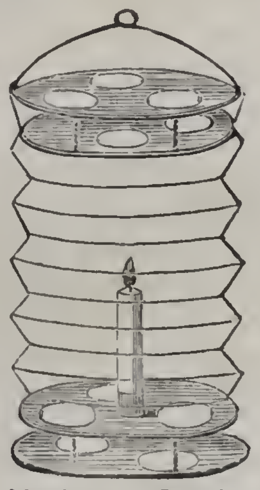
Considering the ease with which, by means of this process, the sensitiveness can be increased, Mr. Stosch says it may be used with advantage in many cases. It might be expected that in developing, the plates would work more vigorously in consequence of the presence of silver nitrate, as the emulsion, according to Eder's No. 1. process, gives very vigorous plates. But by using Stosch's alkaline and alcoholic bath, and following up with the Nelson developer (as in Vogel's emulsion), very soft and extremely sensitive plates are obtained ; if proper care be taken (new and well cleaned plates, and treble or quadruple ruby panes), they will be very clean, and quite free from fog, and the length of exposure may be reduced to $\frac{1}{14}$th or $\frac{1}{16}$th of that necessary for wet plates.

In the same communication, Mr. Stosch remarks that he has often found with gelatine emulsion plates, which at first were quite good, that the emulsion suddenly turned granular, and that the silver bromide became precipitated. This was found more especially to be the case in hot weather, or when the washing of the emulsion had been long continued, or when, at the time of coating the plates, the emulsion had a temperature of from 35° to 40° C. ; he found also that in such cases the emulsion has a distinctly sour smell. The addition of 4 or 5 drops of ammonia to 200 cub. centm. of the emulsion was generally able to cure the evil. When fixed organic acids or volatile mineral acids had been purposely added to the emulsion, and provided that the plates after drying had been dipped in an alcoholic solution of ammonia (100 alcohol to 10 ammonia), they were found to be not less sensitive than those not treated with acid. According to this experience, the presence of fixed organic acids does not seem to affect the sensitiveness of emulsified silver bromide.

◆

DEVELOPING TRAYS AND LANTERNS FOR TOURIST PHOTOGRAPHERS.

Dr. Hermann Fol is good enough to send us the following practical hints :—This is the season when many think of going abroad with camera and dry plates, and a suggestion about the simplest and lightest accessories may therefore be welcome. It is important upon a journey, to be able to develop a plate now and then, to make sure that all is right with one's exposures. But alas ! lantern and trays are amongst the most cumbrous paraphernalia to carry about. I make my trays simply by taking pieces of stout parchment-paper, about one inch and a half broader in every way than the plate. I fold up the edges of the paper, and fasten the corners with small metal clips. The tray is laid upon a flat piece of board or upon a glass plate, and the developing and fixing solutions are successively poured upon the exposed plate. Such a tray keeps quite firm, even for a prolonged operation ; afterwards, of course, it is thrown away ; but as parchment-paper is very inexpensive, this is not of much moment. A dozen or two pieces of parchment-paper take very little space in a travelling bag, and cost very little.



The most portable lantern I make by painting over common white paper Chinese lanterns with collodion containing castor oil and fuchsine. The top and bottom of the lantern are made each of two thin metal plates fastened together by three small chains. Each plate is pierced with holes, and each pair is fastened to the chains so that the holes do not correspond, and half an inch remains between the two plates. No white light can then find its way out. The upper pair is of course unfixed, and may be lifted out to get access to the candle. This lantern folds up into the smallest possible compass, and when in use perfectly precludes all actinic light without getting hot.

◆

CLUB SITTERS.—No. 2.

BY "CLIFF."

Some few days after the advent of my angular customer, I had my first re-sit; it was, as usual, a lady—the wife of a well-to-do publican in the town. She rejected the first sitting by saying, "Oh ! Mr. Cliff, I have brought back the proof, and I really couldn't think of having a painting made from this; it makes me look positively plain, and this dress doesn't 'come out' at all well. I have put on a black silk now, and, if you are disengaged, perhaps you will kindly take another."* I took a second negative, and as that did not quite satisfy me, another, and yet another, and then got something which, with a good lot of touching, might make her passable, if not even good-looking. Then I thought I might stop. "Rather hard work for half-a-crown, though!" soliloquised I, as I wiped my hands preparatory to leaving the sanctum. Judge of my exceeding astonishment, not to say horror, when the lady put on the table, not a half-crown, but a one-shilling piece, saying, "I may as well pay for the re-sitting now, Mr. Cliff!" "Thank you," I replied, "that will be two and sixpence." "Oh, no!" responded she; "it says on my ticket that we can be taken again for one shilling, or have any number of extra positions to choose from at the same price."

I tried to explain that that referred to sitters at Messrs Jones' own studios, and that I had made an arrangement with their Mr. Slithery to have half-a-crown for all re-sits at my establishment. She didn't seem to see it, and said something about "imposition" which I did not catch. But in the end she paid the half-crown, and sailed majestically out, firm in the conviction that she had been the victim of a tremendous swindle. The day after this encounter I received a letter from Messrs. Jones, asking me, as a favour to themselves, to take a second negative, if required, for a shilling. As they wrote in a gentlemanly and business-like manner, I agreed to do so, especially as I foresaw innumerable conflicts with sitters in the event of my declining; and I may here remark, that the "blessings" I called down on the devoted head of the misleading Slithery were neither few nor unvaried.

I was now taking an average of twenty sitters per week for club portraits, but I found, to my unspeakable dismay, that my ordinary sitters were falling off at a very rapid rate, and that, notwithstanding Slithery's assurance, they were all going for the thirty-shilling portrait. One man, the manager of a bookbinding establishment, had managed to start no less than six clubs. He was a little foxy-haired and bearded specimen of the genus homo, and I regret to say that he was personally as 'cute and foxy as his hair. I was one morning informed that Mr. Sleep—that is the name we will call him—was in the reception room, and wished to interview me. His mission was to inform me that he was going to try a house-to-house visitation of the town with a specimen portrait, and endeavour to form more clubs; he, personally, had no doubt that he could get up at least six more, and the question was, "What would I allow him on each sitter?" I remarked that he was employed by Messrs. Jones, not by me, and that they were the proper people to apply to. In response, he said that they already allowed him five shillings a head, and he certainly thought I might make it more worth his while by adding an extra half crown. This suggestion struck me as being decidedly cool, so I despatched Mr. Sleep somewhat summarily. The result was, he went to another photographer in the town, and asked him the same question, and, receiving a favourable answer, dropped Messrs. Jones a note, stating that he could get up many more clubs if Mr. Scruemup took the negatives, but that my work had not given satisfaction. Messrs. Jones then authorised their agents to send the sitters either to Scruemup, or myself, and another agent came to me to say that he had only managed to get members to his club on the condition that I took the negatives, and that Jones and Co. wanted them sent to the other man. He showed me the letter from that firm, which he had partially misunderstood, and I explained that he might send them to either; but, in future, he would please not send them to me, as I intended resigning the business. I sent in my resignation that evening; Jones and Co. refused to accept it, and continued sending me sitters, but as I sent them on to Scruemup they soon got tired of the game, and I was left in peace.

Soon after this the people got dissatisfied with the results of enlargements by collodion transfer; the cut-out looking heads, covered with gaudy colouring, were getting much too common, and such remarks as "Oh, you've got one of the shilling a-week pictures, have you?" disgusted most of the owners of tea-tray monstrosities. Then came my time. I entered into an arrangement with a well-known artist to paint me pictures on a carbon basis, and offered them at the same price. I sold a few, but the sword seemed to have cut both ways, for oil paintings of any kind are now very rarely asked for, so afraid are folks that their friends shall imagine they have paid a shilling a-week for them. The system of clubs has been overdone, and the trashy enlargements, together with the similarity existing between all club portraits, has brought the system close to its end, and when that much-to-be-desired consummation arrives, we may hope that photography will look up once more.

◆

At Home.

MR. MARSHALL WANE IN GEORGE STREET, EDINBURGH.

The first in our series of Scotch studios—that of Mr. Fergus, at Largs—was selected by vote; this (the second) we chose ourselves. Nevertheless, we shall take little credit for our discrimination, for the name of Mr. Marshall Wane has been so long a household word in photographic circles, that to visit the city of Edinburgh without entering Mr. Wane's studio would have been foolish, indeed. We do not know exactly how many medals Mr. Wane's magnificent pictures have brought him, but we counted at least five gold ones among the emblems of honour he has won; and those who are familiar with his work will not, we are quite sure, grudge him the possession of them.

Mr. Marshall Wane's studio in George Street ranks second to none in the kingdom. The handsome pair of rooms on the first floor, which contain examples of Mr. Wane's art, make a magnificent show, and especially for this reason; his portraits are not only executed with taste and artistic effect, but they are of grand proportions. What say our readers to studies taken direct from life measuring 24 by 20 inches, possessing all the vigour, brightness, and finish we are wont to see in first-class small work? Mr. Wane seems as used to plates of these Brobdingnagian dimensions, as if he had handled them all his life. There are a dozen examples of portraits in the gallery of these dimensions, and their breadth, atmosphere, and rich shadows are wonderful. Look at the brilliancy and purity of tone of this series of fancy-dress portraits, all taken direct on 24 by 20 plates. Here is a Madame Pompadour, the blue and pink satin represented by delicate grey and almost purple tones; and here a running footman of the olden time, with shining black hat and white gloves. They are but monotone prints, but the richness and harmony of tone seem to compensate for the absence of colour. A portrait of Miss Carlotta Leclerq, in a dress presumably of damask satin, also deserves mention. The sheen of the satin is delightful; and the damask figures in robe, according as the light strikes them, and makes them appear sharp or hazy of outline, are particularly effective, leading one almost to suppose that a clever painter must have been at work on the drapery. Mr. Wane, of course, makes use of gelatine in the production of these fine pictures, and it is certainly putting the "new power" to good purpose. During our visit one of these monster plates was exposed; a cabinet picture was first secured as a trial-plate—for it was a new batch of gelatine films—and then the bigger plate was put in the camera and exposed. Dallmeyer's 8D, a lens of eight inches calibre, was used, with an exposure of fifteen seconds. We may mention, by the way, that Mr. Wane's studio experience of gelatine plates is, that they are practically from four to five times as rapid as wet collodion.

A forcible portrait of Sir H. Loch, the Governor of the Isle of Man, is a picture of which Mr. Wane may be justly proud, the modelling of the hands and vigorous rendering of the beard being masterly. "I think Mr. Wane's photographs wonderfully good," is a dictum bearing the signature "Louise Lorne;" and we make so bold as to echo Her Royal Highness's opinion; only, if we remain here in the gallery all day, we shall never get a peep behind the scenes.

---

* S meant "portrait," not "dress."

There are two studios, and they are both of them very roomy. There is little furniture about, and all of it is real and substantial. In Edinburgh there is plenty of light and consequently it may be screened off without compunction. Mr. Wane, on the light side of his studio, uses a double tier of screens, one above the other, each screen measuring about four feet square; the screens fit into grooves against the glass, and so slide to and fro at will. The roof (see fig 1) is raised in the centre, so as to give additional height, an arrangement, in Mr. Wane's opinion, that permits of more effective lighting under certain circumstances. The dressing rooms are fitted with Japanese mirrors, viz., a mirror in front, with others on hinges at each side thereof at right angles—certainly the most favourite form of looking-glass with ladies.

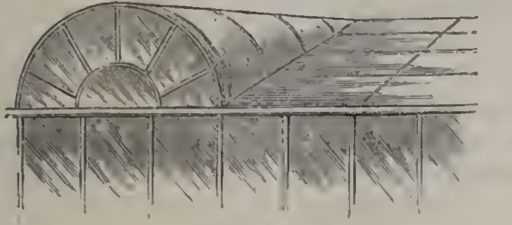


Fig. 1.

This is the finishing room. Mr. Wane uses fresh paste for mounting, and eschews black cards. As each picture of carte or cabinet size is finished, it is put into a large table drawer, of which there are several divided into small partitions or nests. The partitions have a little nitch cut into the side, so that the cards may easily be lifted out and counted at any moment. As soon as the number of cards is complete, and the order satisfied, they are taken out and sent off. By this table-drawer arrangement, the chief can always inspect the state of an order at any time, examine the work, and know how far it has progressed.

Upstairs are the enlarging, printing, and washing rooms. In Mr. Wane's establishment the scissors are used for trimming prints, the cuttings being collected every day and burnt, so as not to get trodden on and dirtied. In one of the rooms the fire-place has been removed, and, in lieu thereof, an iron box measuring about 24 by 18 inches, and some 20 inches deep, is located, into which the cuttings are put and ignited. This is not only a most tidy arrangement, but an economical one into the bargain.

Mr. Wane washes his prints in a revolving cylinder, with the nature of which some of our readers are familiar. After the pictures have been fixed, and rinsed in three or four changes of water, Mr. Wane professes to wash them in twenty minutes; and we are bound to say that some prints we took away with us, and examined for hyposulphite of soda by the well-known iodide of starch test, proved quite free from that compound. The washing apparatus consists of a drum-like cylinder, perhaps two feet in diameter and three feet long. It is placed in a horizontal position, as shown in our sketch (fig 2).

The outside cylinder, A, is simply a casing of tin to keep in the water; the inside cylinder, B, that revolves, is a few inches smaller than the exterior one, and it is simply a frame-work covered with a twine netting. If you look inside the apparatus when it is at work, you see this inside skeleton cylinder, B, revolving rapidly, upon the net-work being laid prints in the act of washing. These prints are washed in a two-fold manner. Water is squirted upon them in the form of little jets, and this water is again thrown off by centrifugal force, as the skeleton drum bearing the prints rapidly revolves. In fact, the machine not only washes the prints, but, at the end of the operation, when the water is turned off, it goes a good way towards drying them, for as the drum continues to revolve, the water is thrown off the wet pictures. The outside cylinder, or jacket, as we have said, is simply for the purpose of preventing the water, thrown off by centrifugal force, being sent into every corner of the apartment.

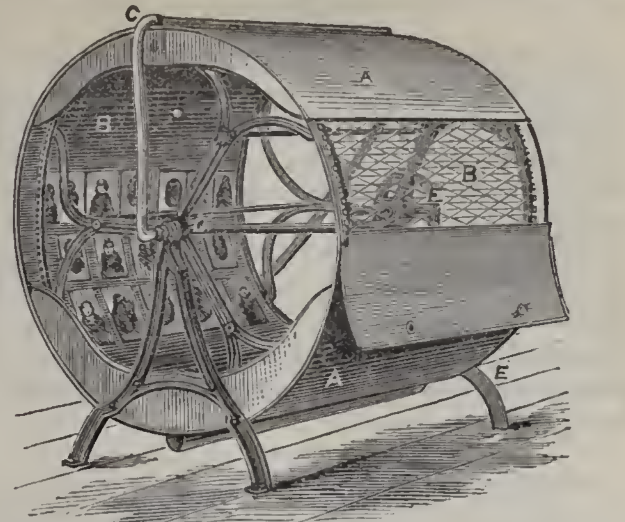


Fig. 2.

The water is supplied by two iron tubes pierced with small holes, which tubes run lengthways through the drum—or, to speak more correctly, parallel with its axis. One tube, indeed, runs right through the middle of the drum, D, and the jets of water from it fall upon the faces of the prints as they come round in turn, lying inside the skeleton drum. The other tube, C, also pierced along its length with water holes, is at the top of the apparatus, between the outer cylinder and the revolving cylinder, so that the prints lying upon the network come round with their backs towards the falling water. Thus the prints, as they revolve, are first treated to a shower in front and then at the back, and one can readily understand that pictures subjected to a continual spray, and, moreover, to centrifugal action, for twenty minutes, are likely to be as well freed from any hyposulphite they may contain, as immersion in running water for many hours.

The apparatus may be turned by hand, for it is very light; but Mr. Wane objects to this, for the reason that a stoppage at any time may bring about a fall of the prints, since these are kept in position around the inside of the cylinder by centrifugal force. On this account Mr. Wane has recourse to a water-motor, E, which is nothing more than a water-mill; the water main supplied to his house in Edinboro' is quite potent enough to work the motor, which, we may mention, can be constructed by any water-engineer who knows his business. It may be mentioned that a washing drum working vertically does not seem to answer so well as the horizontal arrangement.

We have no time to speak of Mr. Wane's excellent printing arrangements (the printing is all done under ground glass, or under tissue paper), nor of his admirable way of storing negatives, each with its number plainly marked under the rack; but from an elegant little card of terms, we quote the following to show that good prices are to be had in the Scotch capital for good work.

Cartes, per dozen ...	from £0 15 0	to £1 1 0
Cabinets, per doz...	from 1 5 0	to 2 2 0
10 by 8 in gold frame complete	...	2 10 0
12 by 10	...	3 10 0
15 by 12	...	5 5 0
20 by 16 (direct from life) ...	...	7 7 0
24 by 20 (do. do.) ...	...	8 8 0

The "Bye the Bye" next week will be "With the Camera on the Continent;" the following "At Home," "In Princes Street, Edinboro'."

Notes.

The observatory on Ben Nevis has now been a fact for some months. The camera is not yet in use as a recording or observing instrument, for the simple reason that there is, as yet, no proper building or shelter upon the loftiest mountain in the United Kingdom. The indefatigable observer, Mr. Wragge, who lives at the base, has to climb the summit every day; he begins the arduous toil at five o'clock in the morning, and arrives after some four hours' work. One hour, from nine to ten, he spends on the top, his instruments being arranged behind a stone screen, to protect them from the weather. He gets home again at two in the afternoon.

Only those who have climbed the four thousand feet and more up the rugged side, and are intimately acquainted with the sharp angular masses of granite over which the pedestrian must pick his way for a good third of the distance, can appreciate the exertions of the Ben Nevis observer. The mountain is but 4,406 above the sea-level, but then you start *at* the sea-level, near Fort William, and have to climb every foot of it. For this reason, Ben Nevis represents more arduous work than many of the reputable peaks in Switzerland. Thus, we have climbed the Piz Languard in the Engadine, which is full two thousand feet above the snow-line, in much less time than Ben Nevis, for the simple reason that the village whence we started was already six thousand feet high. The sea-level is a point to be taken into consideration, both at the beginning and end of one's journey.

Piazzi Smyth, the Astronomer-Royal of Scotland, is again calling attention to the formation of clouds as forecasts of the weather. The Scotch astronomer, it may be remembered, was the first to suggest taking regular photographic records of changes in cloudland, and initiated the work by securing a most interesting series of such pictures. One of these days we may see cloud cameras at all the meteorological observatories.

Anthony's Bulletin contains a capital portrait of Professor Henry Draper, of New York—one of the best known of our scientific photographers. Professor Draper has not only taken a photograph of the comet, but, by exposing a gelatine plate for two hours and forty-two minutes, secured an image of the tail, 10° long, the plate showing many stars shining through the tail.

During this long exposure of two hours and three-quarters, it must be borne in mind that the camera was moving; or, perhaps, it would be more true to say the camera was stationary, while our earth was moving. The camera is mounted in a so-called equatorial telescope, which, by means of well-regulated clock-work, is made to point steadily at the comet until the required exposure has been made. But, as the best of clock-work will not move with the same accuracy as our earth, it is necessary to correct from time to time by hand, and for this reason it is that astronomical photography is alike so tedious and exacting.

The death of Mr. R. W. Thomas, of Pall Mall, removes a familiar personage from our midst. For thirty years past the name of Mr. Thomas has been an authority on matters photographic, and "Thomas' collodion" is a household word, not only in this country, but wherever photography is practised. Mr. Thomas' scientific knowledge was of no ordinary character, and enabled him to take high rank as an experimental and manufacturing photographic chemist. He was a Fellow of the Chemical Society, and for some time a member of the Council of the Photographic Society of Great Britain. He served in the capacity of honorary treasurer to the latter Society for several years, and took a deep interest in its welfare. Mr. Thomas died on the 6th inst., aged 58.

Workers with ferrous oxalate have been recommended to add a little fixing bath to the developer to ensure clearer negatives; now they are told to add developer to the fixing bath to get greater brilliancy, in the proportion of one ounce of old oxalate solution to the pint of hyposulphite.

Those who travel with the camera will be grateful to Dr. Hermann Fol for his simple plan of making developing trays with parchment-paper. We see, by the way, that parchment paper is to be purchased at the railway book-stalls, so that it is never too late, even for tourists on the point of starting, to avail themselves of the hint.

Messrs. Piper and Carter promise Dr. Eder's book on Modern Dry Plates by the end of this month; it will practically be a new edition of the doctor's German work. Captain Abney has a second edition of his Emulsion Book in the press, so that photographers will be able to make comparison between the two authorities.

The regulations for the autumn Exhibition in Pall Mall have now been published, and will be found in another column.

We saw some eclipse photographs of a novel character the other day. They were not pictures of the sun half eclipsed by the moon, but of the crescent-shaped light-spots that lurk under the trees during the phenomenon. As everybody knows, under ordinary circumstances, sunlight coming through the foliage of a tree or other interstices, no matter what shape, is thrown upon the ground in the form of round disks, the shape of the sun itself; and in these eclipse photographs, the bright spots under the trees had also taken the form of the sun for the time being, and consequently were crescent-shaped.

A photographic museum is to be established in Paris at the *Conservatoire des Arts et Metiers*. Already some valuable historical objects have been collected, but much has still to be done to illustrate all the principal processes since the days of Nicephore Niepce and Daguerre. Certainly no time should be lost in procuring early specimens; every year that passes makes the task of forming a historical collection more difficult.

For retouching opaque objects, either by day or night, a decanter of water will be found exceedingly useful for condensing the light upon one's work. Artists, when drawing upon wood, find a simple lens of this kind of wonderful assistance in illuminating their fine pencilling.

Mr. W. K. Burton, C.E., lectures this evening on photography at the Royal Aquarium, before the members of the Balloon Society.

It is an ill wind that blows nobody any good. The Parliamentary Enquiry into the funds of the great City Companies has led to the rapid inflation of the City and Guilds of London Institute, to which the Companies have contributed money in double quick time. Upwards of £75,000 has been hurriedly given towards technical education in this way, a most laudable object, as the Prince of Wales properly remarked on Monday, when he laid the foundation stone at South Kensington.

The only question is whether the money was entrusted to the Companies for this object. When King Alfred was minding the cakes in the neatherd's hut, he received the gratitude of a beggar to whom he had given a roll hot from the hearth. "You are quite welcome, my man," was the king's laconic remark; "they are not mine."

Topics of the Day.

HOW I RETOUCH AND VARNISH MY GELATINE NEGATIVES.

BY J. B. HARRISON.

How I Retouch My Gelatine Negatives.—In my own practice, I always retouch negatives before varnishing, as I find the film much better to work on than either varnish or mediums; besides, the varnish, being over the pencil, is a great protection against the possibility of the lead being rubbed off in the printer's hands.

I may just mention that my retouching desk is fitted with a glass coated with matt varnish. I use a mirror behind it for reflecting the light on the negative. I also keep a piece of cardboard, with a round hole in the centre, about one-and-a-half inches in diameter, to put over the negative when working on it.

Here it may also be useful to give the contents of my drawer, which is placed under my retouching desk, and in which I keep my black-lead pencils (varying from hard HHH to soft BB), leather and paper stumps, a small box of resin ground very fine between two glasses, a piece of Gihon's opaque, a spotting-brush, a penknife, and a thin piece of steel finely pointed.

My mode of working (after the gelatine negative is dry) is to place it on the desk in the position I want it, then dip the tip of my finger in the box of ground resin, and rub the place to be retouched in a circular form. It requires very little rubbing to get a surface on the negatives, upon which I can work to any extent I choose.

For ordinary good negatives, I take an ever-pointed pencil-holder, with a Faber's HH lead in it, and, after sharpening it on a piece of fine sand-paper, which I have nailed on a piece of wood, by my side, I begin at the left side of the face, and work with fine stipples until I have taken out all the roughness and defects in the skin. If the eyes require strengthening or sharpening up, I do to them then what is necessary; and if the high-lights are not quite strong enough, I take a softer pencil, and, with a few careful stipples, strengthen them, taking care that my stipples are placed in the same direction as the muscles of the face are.

If my negative be of a freckled-skinned person, I take a soft pencil, and work out the freckles, taking care not to get too much lead on, or spoil the shape of the face; after, I take the HH lead, and stipple very carefully between the other work that is already on the negative. In this manner I gain a very nice effect in the finished work. When the head is finished, I take out with a soft pencil whatever defects there may be in the hands, drapery, or background.

It may be well to state that I always aim at getting a pleasing effect in the finished work, as far as is consistent with keeping the likeness. I do not like to see the lines about the face and eyes totally obliterated; but I just soften them down so that they do not appear too deep in the finished print.

Perhaps it would be very useful to some to know how I proceed with an under-exposed gelatine negative in which the high-lights are much too dense, and in which what should be half-tones are quite transparent. My mode of treating a negative of this description is to matt varnish it at the back, and, when it is set, scrape off the matt varnish from the too dense parts with a penknife or a fine piece of steel. Then I take a BB lead, and work with cross-etching on the matt surface, over the too transparent parts. Then I turn the negative over, and work on the film as much as I think it requires.

Other kinds of gelatine negatives, sometimes met with, are those that lack intensity or vigour of any kind, and in which the coat and background seem to be both alike. My plan of treating these is to get a piece of mineral paper, a little larger than the negative is in size, and place it between damp blotting-paper for a few minutes. I get a weak solution of liquid gum, and, with a small brush, go round the corners of the back of the negative with it; then I take out the mineral paper from between the blotting-paper, and place it on the back of the negative, taking care to get it to stick all round, and, when dry, it will be perfectly tight. I then take a sharp knife and cut out the figure, or anything that I want to print deeper than the rest. When that is done, I take another piece of mineral paper, and place it over the one which is already fastened, and, when this is dry, I take a paper stump dipped in powdered lead, or a BB point, whichever I think best, and work on the mineral paper, strengthening any portion required. I had better state that for a negative of this kind I should varnish before commencing it.

Some might say that rubbing the gelatine film with resin, as described above, would tend to scratch it; but there is no fear of this if the resin be ground fine, and just dusted off before commencing work.

How I Varnish My Gelatine Negatives.—For varnishing I have a Bunsen gas stove, attached to a permanent gas-pipe, which has been put up purposely for varnishing, and one bottle of varnish specially prepared for gelatine negatives, and another empty, together with funnel and filter paper. My mode of proceeding is to light the gas stove, warm the plate to be varnished from the back, and coat it from the bottle of varnish in a similar manner to coating a collodion plate. I don't pour back into the same bottle, but drain it into the empty bottle, which is supplied with a filter-paper. I then just warm the plate again until it sets, and place it in a rack, to get hard. By draining through a filter paper, I have always clean varnish, which is very necessary for obtaining clean prints.

Before passing the negatives on to the printer, I just take my spotting brush, charged with Gihon's opaque, and do what spotting is required in them.

I may here mention that I do not like to pass the negatives out of my room before three or four hours after varnishing, as the varnish sticks to the paper if printed from too soon.

BY WILLIAM SHAWCROSS.

THE first thing I do on receiving my batch of unvarnished negatives for the day is to write the name of the sitter on the negative with a stocking needle. This I find is a better plan than writing with ink. The ink occasionally gets washed or rubbed away, but the name scratched in with a needle is always there.

I next carefully rub every part of the negative to be worked upon by the following medium:—

Turpentine	4 drachms
Gum-dammar	6 grains

I do not recommend making up a larger quantity, as it seems to work better when fresh.

With regard to this retouching medium, I cannot say too much in its praise. It takes the lead more freely than any other medium retouching varnish, or any of the modes of rubbing the varnish to get a " bite " for the lead. I can use a much coarser point on the pencil, which is a great advantage, as the work is finished much quicker than with a fine point. It is astonishing what can be done with an under-exposed or a thin negative by means of the medium, and finally, the work does not run in the least when varnishing, and has a much softer effect.

In case the negative should require a little more work after varnishing, or some slight alteration, I lightly rub the varnish with a little powdered resin on the tip of my finger. I prefer resin, as it does not leave any mark or halo round the head. This, however, I only do in exceptional cases, as the advantages of having no retouching on the varnish to rub away are obvious, more especially when the prints from the negative are for publication. Should the negatives get dirty from long printing, the varnish can be washed off with methylated spirits, and varnished again without injury to the retouching.

The medium I keep in a small glass stoppered bottle, and I apply it by getting a little on the top of my finger, and rubbing it gently on the negative until it is almost dry, softening away the edge, so that there is no line round the head.

After my negatives are all rubbed, I take each one in the order of sitting, or as the emergency of the case requires, and carefully take out all spots and freckles with a Faber's B or HB pencil. With a harder pencil (from H to HHHHH as the density of the negatives demands), I next soften the lines and curves of the face. With a circular motion, I then go all over the face, taking out what catches my eye first, *not* commencing at the forehead and working down, but doing a little on the forehead, a little on the lighted side of the face, and then a little on the shadowed side—in fact, running from one part of the negative to another, until the face is entirely finished. This I find is much better (so far as keeping the likeness and character of the face is concerned) than the plan of beginning at the top, and finishing every part of the face as you work down.

When the face is finished or " modelled " to my satisfaction, I again take a soft lead and lighten up the hair, strengthen the lights on the frills, collars, and dress if required. I then finish off the negative by spotting out with a sable brush and Indian ink. I take out every spot, so that it does not show either black or white in the print. It is worth all the extra trouble to do this, for while on the negative you only have to do it once, on the print it is six, twelve, or twenty-four times, and in case of publication an unlimited number.

I use an ordinary retouching desk, and work with an open aperture, regulating the light by means of sheets of paper laid on the bottom, and ranging from white to a dark blue; the one I generally use is of a medium blue, which I find does not try the eyes so much as white, while at the same time it gives more body to the negative. On dark days, or for very strong negatives, I use a piece of silvered glass to reflect the light.

When my day's work at retouching is done, I proceed to varnish my negatives with the following varnish. I put orange shellac into a wide-mouthed bottle until it is two-thirds full, fill up with methylated spirits, cork, and let it stand for a day or two, shake it well, and filter. If too thick, dilute with more spirit to the strength required. This varnish is the best, and at the same time the simplest, I have yet tried. It is very hard, does not get tacky even in the sun, resists damp, and does not gather dust. I have used it for some years for wet plates, and never found a negative that had had this varnish to crack or leave the glass, and it does equally well for gelatine plates.

In winter I varnish the negatives by a clear fire, which I take care is free from dust on the bars. In summer a gas stove or spirit lamp will do equally well. I see that all doors and windows are closed, as a current of air causes dust to settle on the varnish. After warming the negative, I carefully dust it with a broad camel's hair brush. Pour on the varnish from one bottle, flow it over the plate, and pour off into another bottle, and again warm the negative until it is dry. After the negatives are all varnished, I stand them on a shelf, and in the morning (by which time the varnish is quite set) I deliver them to the printer with instructions as to style of printing.

In some cases, and where proofs are required, it is better to print the proofs before varnishing. This can easily be done, without injury to the gelatine or retouching, by printing through thin sheets of talc. If any alterations are required, they can then be done before varnishing.

In conclusion, I may say that the above is the best plan arrived at by me after some years' experience. It is followed out daily by me as retoucher to a large firm, many of whose photographs are for publication.

BY E. A. MAXWELL.

I ENDEAVOUR to get the negatives dry in the evening, in order that they may be varnished, and left to harden during the night. This of course cannot always be done, negatives sometimes being taken very late in the day; the varnishing must then be left till the morning, and a certain time allowed for hardening, thereby delaying the retouching and printing.

There are cases when proofs are required in a great hurry, and the negative is therefore immersed in spirit, and dried off by heat—retouched and put direct into the printing frame. These negatives, however, are liable to remain unvarnished altogether, being out of the ordinary course, and so run the chance of damage from damp, silver staining, and other evils natural to gelatine. It is best, therefore, to do all in the usual routine, and varnish first.

Numerous are the opinions expressed on the subject of varnishes suitable for gelatine plates, many clamouring for the hardest possible kind; but this idea I certainly cannot endorse, for having tried nearly every commercial brand, I incline to a soft varnish, as with it you can dispense with all "mediums," such as turpentine, "matteline," resin, cuttle fish, and so forth, the first leaving a nasty stickiness on the negative, while with the latter you are liable to scratch the film, and are almost certain to create numerous black specks thereon.

The negative must be dried spontaneously, and only in very exceptional cases use heat, when all moisture has been expelled from the film by alcohol. Heating a moist gelatine film will often produce the most startling result; so be on the safe side, and dry by a current of air. A good way is to raise a window a few inches, and stand the rack in the draught. Upon the negatives being thoroughly dry, warm them slightly, dust with a camel hair brush, and pour over the varnish (which must be kept well filtered), drain closely, warm again, and leave to harden.

When ready to retouch, you may, supposing a soft varnish to have been made use of, proceed to work on the surface without preparation, or may produce the finest imaginable matt surface in this way. Rub the tip of the finger somewhat sharply on any part of the negative that will not come into the finished print; this will produce a little fine powder, which you take on the ball of the finger and gently grind the surface of the varnish on the part required to be retouched, using a circular motion, lightening the pressure as you come to the edge, so that no line of demarcation may show between the rubbed and unrubbed surfaces.

There is no need to have the retouching desk of any particular form, provided that a good light is reflected through the negative, and all other light shut out. The desk I am using is constructed from an old drawing-board. A circular hole is cut in the centre of the hinged flap about two inches in diameter, backed with ground glass, a series of holes on each side of the board, supported by means of pegs, a lath on which the negative rests, a vertical and horizontal movement being thereby attained, and negatives of any size can be accommodated thereon. Place the desk in any window where the sun does not shine, and so arrange the looking-glass that the light from the sky is directed through the aperture; close all in with a cloth, and everything is in readiness to commence work.

It is well to have more than one pencil, but do not have too many, for they prove an *embarras des richesse.* I find an HB and an HH the most useful tools. Cut them carefully with a sharp knife, leaving about half-an-inch of lead exposed. Finish off to a delicate point with the finest procurable sand-paper. With the HB pencil then proceed to fill in all the most palpable defects – holes in the film, freckles, &c.; then take the harder pencil, and soften the strong lines. The modes of using the pencil are various, for, on magnifying the work of several retouchers, you will find some done entirely by stippling, others by lining and cross-hatching. It is, of course, a minor point, and depends on the taste of the retoucher. I incline to a touch that may be described as an inverted comma, and, with this somewhat circular movement of the hand, tone down the wrinkles on the forehead, crows' feet, and lines about the mouth, leaving almost untouched the shadow under the eyes. The high-lights are then strengthened (the forehead, cheeks, nose, and chin), and a little—a very little—over the eyebrows.

The process of retouching is one of the most difficult in photography, and brings out what artistic qualities you may be endowed with. The greatest care must be used, as the likeness is quickly impaired. The deep-set lines may all be modified; but only in very exceptional cases entirely removed. A frown, or other unpleasant expression, can often be alleviated, but must be done very delicately. Beware of touching the eyes, and, above all, don't do too much to the negative. I always content myself with a fairly smooth face, and do not yearn for a waxy, doll-like countenance; for, if work is turned out in this way, you get the reputation of flattering your sitters. I may not get as fine a stippled surface as many, but, at any rate, I flatter myself, I do not lose the likeness.

The "Topic" next week will "Carbon Transparencies for Enlargements," by J. Burton.

PREPARATION OF PHOTOGRAPHIC ASPHALT.

BY DR. R. KAYSER.*

RECENT investigations of natural asphalts have shown that the sensitive constituent of these substances is insoluble in ether. In order to separate this constituent in as pure a state as possible, and free from all other impurities of the asphalt, the following method is strongly to be recommended. Syrian asphalt is broken into small pieces not larger than peas, and dried in a dark room; by this means the natural moisture of the asphalt, which is often found in the mass in the form of small drops, is driven off. The desiccation must be effected at a temperature of from 40° to 50° C., and the asphalt is then reduced to a fine powder in a mortar, an operation which, as with all resins or resinous substances, is best effected in tolerably cold weather. This powder is then, by small portions at a time, dropped into three times its volume of ether, shaking it well as each portion is added. The mixture is now left to stand for three or four days at the ordinary temperature of the room, taking care to stir it well frequently, and the solution is decanted off, the mass which remains undissolved being again shaken up with a small quantity of ether, in order to remove all the remaining soluble portion of the substance. Chloroform in twice the volume of the asphalt originally treated is now poured over the portion which has not been dissolved by the ether, and the mixture is again set aside to stand, but with frequent agitation, at ordinary temperature; and when the solution has been accomplished, the mixture is allowed to rest completely for a day, and the clear chloroform solution is drawn off. From this solution the chloroform can be recovered by distillation over a water bath, and the solid remaining behind will be found to be the sensitive portion of the asphalt. A small quantity of chloroform will still be retained by the residue of the distillation, and can be removed only with extreme difficulty; but as it has no injurious effect on the preparation of asphalt, its presence may be disregarded. This preparation can now be dissolved in rectified oil of turpentine in the proportion of 1 : 15, in the ordinary asphalt process, and can then be developed with a mixture of olive oil and oil of turpentine.

PHOTOGRAPHS ON WOVEN FABRICS.

BY WINTER AND CO., VIENNA.*

THIS invention consists in producing photographs on woven fabrics, and preparing them for the reception of oil colours—in such a way that these do not sink into the stuff, while the image remains protected from the action of the atmosphere. Photographs taken in this way have the advantage over paper photographs that they can without damage be thoroughly washed or even boiled, so as to remove all traces of chemicals which can injure the picture; but it is nevertheless very necessary to protect photographs on woven fabrics against the action of damp or impure air, and to render them permanent by the use of proper preservatives. It is also absolutely necessary to render these photographs so dense (without sacrificing any of their delicacy and vigour) that they can be painted on in oil colour, and yet that none of this colour may be allowed to sink into the originally permeable mass of the stuff. The nap of the cloth must be laid, in order that the colour of the picture may not look rough and hard.

The method of execution in this process is as follows:—1. The stuff on which the photograph has been taken must first be stretched in a wooden frame, and then coated on the picture side with wax, until the fabric gradually becomes impervious, and appears smooth and compact. 2. After this has hardened, the image is painted over on the reverse side with a soap compound, which dissolves the wax, and combines with it in such a way that (*a*) the photograph is completely shut off from contact with any damp or otherwise injurious atmosphere; (*b*), the stuff becomes as consolidated and firm as a canvas prepared for oil painting; (*c*) the transparency of the tone and the depth of the photograph are brought out to such an extent that in brightness and vividness it far surpasses one taken on albumenized paper. Pictures executed in black and tinted oil-colours are then coated with varnish, and treated like ordinary oil paintings.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE Exhibition of the Society for 1881 will be held at the Gallery of the Royal Society of Painters in Water Colours, 5A, Pall Mall East, London, S.W. It will be inaugurated by a Conversazione, open to members and their friends, at 8 p.m.

---

* *Deutsche Photographen Zeitung.*

on Saturday evening, the 8th of October. The Exhibition will remain open daily (Sundays excepted), from Monday, the 10th of October, until Saturday, the 12th of November. Admission (from 10 a.m. till dusk), one shilling. It will also be open every Monday and Saturday evening. Admission (from 7 to 10 p.m.), sixpence. Members will be supplied with tickets to admit their friends.

All packing cases must be sent (carriage paid) addressed to the Photographic Society of Great Britain, care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London, so as to arrive not later than Friday, September 30th. No packing cases can be received at the Gallery. Pictures by hand will be received at the Gallery, 5A, Pall Mall East, on Friday, September 30th, until 9 p.m.

Each exhibitor must send a letter of advice (containing a description of each picture, as also a statement of process, and any further details to be inserted in the catalogue, and it is suggested that when the work shown is also taken upon emulsion plates, prepared and made by the exhibitor, it is desirable that distinct information as to particulars of the same should be written on the back of frame), addressed to the Hon. Secretary, Photographic Society of Great Britain, 5A, Pall Mall East, London, S.W.

Each frame or picture may have the exhibitor's name and subject neatly inscribed; but no address, or anything in the shape of an advertisement, will be permitted. No pictures in Oxford frames, and no pictures previously exhibited in London, will be admitted.

Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted.

Photographic apparatus and appliances may be sent for exhibition. Negatives and transparencies will be admissible.

The Hanging Committee will have the power of rejecting any pictures or apparatus forwarded.

Notice will be sent to exhibitors when to fetch away those works which are left at the Gallery by hand, and should any exhibitor not be able to send to the Gallery, he can, by giving notice to the Assistant-Secretary, and paying the cost, have his pictures packed in a case, and returned by carrier.

It is proposed to lay on the table a catalogue containing the price of pictures to be disposed of; those who wish to avail themselves of this proposal will please state the price of their pictures in the letter of advice.

Medals will be placed at the disposal of the judges for artistic or scientific excellence. The judges will consist of the following gentlemen:—Two artists painters, G. D. Leslie, R.A., Hubert Herkomer, A.R.A.; the president of the Society, James Glaisher, F.R.S., &c.; two members of the council, Jabez Hughes, Payne Jennings; two members of the Society, W. Dillworth Howard, Seymour Conway.

No charge will be made to members of the Society for exhibiting their pictures; but to non-members, a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings. Foreign photographers will, for the occasion, be considered honorary members. The charge for wall space to those exhibitors who may become members of the Society at the November meeting will be remitted.

Any further information respecting the Exhibition can be obtained from the assistant secretary, Mr. Edwin Cocking, 57, Queen's Road, Peckham, S.E.

◆

NON-PUTRESCENT AND QUICK-DRYING EMULSION.*

The following is the specification of M. Stoerk's patent:—

My invention consists in introducing into a solution of gelatino-bromide of silver in water, an antiseptic liquid more volatile than the water, which mixes with it in all proportions without precipitating the gelatine, which has no injurious action on the gelatine or on the silver bromide. For this purpose I give the preference to acetone, methylic alcohol (pure 1,000 spirit), or alcohol, either separately or combined. I introduce this substance in the proportion of 50 per cent.

Manipulation.—In 1,000 parts of pure water I dissolve 30 parts by weight of ammonium bromide. To this solution I add gradually a solution of 45 parts by weight of silver nitrate in 500 parts of distilled water. The silver bromide thus obtained is washed during a space of six hours half-a-dozen times, to remove the nitrate of ammonia, as well as any excess of ammonium bromide, so that there remains, after this washing, nothing but silver bromide containing water.

I next add enough pure water to make up 500 or 640 parts containing 5 parts of ammonia, and 24 to 30 parts of neutral gelatine (Nelson's No. 1), and I raise the whole in a water-bath to a temperature of 35° C., and keep it at that heat for six hours. Then I add to the emulsion thus formed from 50 to 100 per cent. of its own volume of acetone, and thus obtain a non-putrescent and rapidly-desiccating emulsion, which is always fit for use.

◆

Correspondence.

SWISS PAINTING.

Dear Sir,—I cannot refrain from expressing my opinion about a statement contained in the "Notes" of the News (p. 294), viz., "There is no special characteristic about Swiss painting, that we could discover, except that it is rather inferior to the painting of other European artists." If this is meant merely as a judgment about the Bond Street Exhibition, I have nothing to say, as I did not see that gallery—may be that all the best paintings were sold off by the time you visited it—but most readers will certainly take it as a condemnation of Swiss painting generally, and to this I feel bound to answer, that painting of Alpine scenery was, for the first time, attempted by Swiss artists—by Diday, Calame, Lugardon. They may have found imitators in other European countries; but I am not aware that any other painter has, until now, excelled, nor even succeeded in producing anything comparable to, their works.—I am, yours truly, H. F.

[We can assure our correspondent that our strictures were simply confined to the Bond Street Gallery, which, if it contains some creditable paintings, also includes a mass of crude and second-class work.—Ed. P.N.]

DR. VOGEL AND HIS EMULSION.

Sir,—Some twelve months since you interested your readers by detailing how yourself and other photographic authorities interviewed Dr. Vogel, and tested his emulsion. Although the said emulsion—a sort of a cross between collodion and gelatine, if I remember rightly—was described as scarcely so good as the best dry gelatine, yet there seemed so many desirable points in it that I have been looking ever since for its introduction to daily use. I write now to ask you and your readers what has become of this emulsion? Did the Doctor not persevere so as to bring it out as a practical article, and, if he did, where is it to be obtained; who uses it, and what is its value as a means of making negatives? Trusting that my enquiries may not be considered impertinent,—I remain, yours truly,

A Country Photographer.

[Dr. Vogel will no doubt tell us something of his emulsion; on the Continent, it has been in the market some time. The last we heard was that a consignment had been sent to Messrs. Rouch and Co.—Ed. P.N.]

EXTRA BROMIDE IN DEVELOPMENT.

Dear Sir,—In the many details of useful information on dry plates appearing in your pages, I think the importance of addition of extra bromide in development during hot weather should be kept in constant view by your readers this summer. A 10-grain solution of bromide of potassium, of which 5 drops are used with the usual developer, tends greatly to keeping shadows clear, and avoiding fog.

It will be remembered that, in the collodion process, corresponding precautions are required. It is especially at this time, too, that the full benefit of glycerine in developing is obtained.—I am, &c., Samuel Fry.

---

* French Patent Office, 27th March, and 20th May, 1880, No. 135,732

COMPLAINTS FROM INDIA.

Dear Sir,—In reference to your correspondents' letters, especially the one in India, I can hardly think that he has sent his orders to any respectable dealer; if so, I shall feel ashamed that I am connected with the wholesale photographic trade.

I have always made it a rule to execute orders for goods that are in stock the same day they are received; and if the articles have to be made, four or five weeks would be the greatest delay.

I cannot understand your other correspondent saying he has here at home remitted money, and could not get his orders fulfilled or his money acknowledged by return. If these cases are frequent, I think the sooner the system of the photographic trading is remodelled the better.

I think, in fairness to the dealers, your Indian correspondent should say whether he sent his orders direct, or through a merchant, because I have often found through the latter there is much delay and many blunders on account of their not understanding photographic articles.

Early last week I had an order from a merchant for a rapid rectilinear lens (no size given), and a bellows camera to suit it. In many cases the merchant would have said, "Refer it back"; but this one was a little more liberal, and said, "Use your own judgment what is required;" and I concluded at once that a rapid rectilinear lens and a camera for 10 by 8 plates would be best to send. Now, suppose this order had been referred back, when would the photographer have got them? And he might have thrown the blame entirely on his correspondent; and yet there was evident carelessness in making out his order. So dealers are not always to blame.—Yours truly,

C. E. Elliott.

Proceedings of Societies.

Sheffield Photographic Society.

The second excursion of the season took place on June 27th, the locality chosen being that known as the Dukeries, comprising a drive through some of the finest sylvan scenery in England. At this excursion ladies were specially invited; a fair contingent joined the party, which numbered about thirty, including the President and officers of the Society. They left by an early train from Victoria Station to Worsuop, where carriages chartered for the occasion at once conveyed the members and friends through Clumber Park to Thoresby, the palatial residence of Earl Manvers. A short stay was then made. It is needless to remark that plates, principally rapid gelatine, were exposed *en route*; but collodion was never used, as the weather proved unfavourable, high wind prevailing, and occasional showers, with the uncertain light baffling to all photographers. Edminstowe was reached about 4 o'clock, and the Mayor Oak, the pride of Sherwood, received attention. Afterwards the party returned to Worsuop, where an ample repast awaited.

The Society held its monthly meeting on Tuesday, July 4th Dr. Merton, president, in the chair.

A question was raised as to the desirability of having a photographic exhibition, and on the proposition of Mr. Hall, seconded by Mr. Frith, the subject is to be fully discussed at the next meeting.

The President invited members to give an account of the result of the last excursion. He suggested that the work of each member should, if possible, be always exhibited and subjected to a little friendly criticism, so that defects might be explained, and perhaps prevented in the future. A number of prints and negatives were then shown by Messrs. Dickinson, Hadfield, Strangefellow, and Dr. Morton, and commented upon.

Mr. Hall brought a large number of prints from negatives taken in his late Eastern tour, views in Egypt, Palestine, Rome, &c., most of which were very satisfactory. Mr. Hall kindly offered to make a selection for the Society's album, which was accepted with thanks.

Messrs. Cubley and Riston sent a new tent for changing plates—a simple but effective looking article. The meeting then adjourned.

Manchester Photographic Society.

The fourth out-door meeting of the season was held at Ashford-on-the-Water, on Saturday last, the 16th inst. Fifteen members and friends left Central Station by 1 o'clock train for Bakewell, where a wagonette and pair was procured, and the party enjoyed a pleasant drive to the village of Ashford. On the way to the Old Bobbin Mill, many charming views were admired, but, owing to the wind, the subjects containing much foliage were not very favourable to photograph. Fifty-two plates were, however, exposed, many views of large size. One curious event of the day was, that whilst Mr. Hodgkinson had left his camera on the ground for a few minutes in search of the best position to take a river view, on returning he found his camera tossed about on the ground, and his focussing-cloth (which was made of black glazed calico, and attached to the same by an elastic cord) removed, and nowhere to be seen. In a short time it was ascertained that some cattle had taken great interest in the instrument, and although no serious damage was done, a cow had eaten the focussing-cloth; for a little while after it was discovered in a very different condition some 200 yards away, having been ejected by the cow. It was then washed in the river, and found to contain some hundreds of holes of various size and shape.

At the Devonshire Arms Hotel, a good substantial tea was provided, to which the members did full justice.

The Royal Agricultural Society's Show at Derby somewhat delayed the ordinary trains, and in consequence, the party was divided till arrival at Miller's Dale, from whence, re-united, they proceeded to Manchester, arriving a few minutes before 11 o'clock.

The next meeting will be held at Prestbury on Saturday, the 30th inst., from London Road, by the 12·45 train. Those who can conveniently, should send a post card to the Hon. Secretary a few days before the 30th.

Thursday Evenings for Photographers.

At the meeting held on the 14th inst. (Mr. A. J. Brown in the chair),

Mr. Cowan exhibited and explained an ingenious arrangement for cutting plates to any required size.

The Chairman said he had coated several sheets of white demy with a solution of aurine, dissolved in alcohol 1 part, and water 1 part, and others with an aqueous solution of rosine; and he found, on testing them with the spectroscope, that the former passes all the rays down to green, and the latter shuts off all the green rays of the spectrum; by using a sheet of each of these two papers, he obtained a very safe light; he also passed round some paper coated with a solution of cardinal.

Mr. Henderson passed round a piece of parchment paper coated with aurine, and also two pieces of parchment, one coated with aurine, and the other with a mixture of aurine and green; he thought that if two pieces of glass, one a pale ruby, and the other a pale green tint, were used, a very safe light would be obtained.

The Chairman said he found that green only stops light, and does not cut off any of its rays.

Mr. Burton said he found that ruby glass generally passes the green rays.

The Chairman described a very simple and effective lamp for changing plates when travelling. It consisted of a piece of aurine paper, twisted into the form of a sugar-paper, placed over a child's night-light.

Mr. Burton said that some time ago he was developing a plate, and as soon as the image began to appear, he took it into the strong sunlight, when he found that it took 30 seconds to fog the plate.

Photographers' Benevolent Association.

The Board of Management held their monthly meeting on the 6th inst., at 181, Aldersgate Street. The minutes of the previous meeting having been read and confirmed,

The Secretary submitted the half-yearly statement, which showed a decided improvement upon the corresponding six months in 1880, notably so in subscriptions from ordinary members, which have increased 50 per cent., and the funds being now £98 13s. 1d., against £65 9s. 5d., the increase since June 30, 1880, being £33 3s. 8d.

Since the beginning of the year over twenty new members have been enrolled. It is to be hoped that the improvement will continue.

Mr. F. A. Barlow, of Exeter, having been proposed and seconded, was duly elected as an ordinary member of the Association.

Correspondence, &c., having been dealt with, the meeting adjourned.

Talk in the Studio.

Fletcher's Solid Flame Burner.—The multifarious arrangements for producing heat by the combustion of coal gas which have been devised by Mr. Fletcher, of Warrington, have made his name a familiar one in the laboratory; and he appears now to be desirous of becoming equally well known in the kitchen. Not only has he recently introduced a series of gas cooking ranges, but he has so modified his well-known solid flame burner as to especially adapt it for domestic use. The small form (fig. 1) will boil a quart of water in six minutes, only one cubic foot of gas being consumed; and this form possesses the considerable advantage of burning properly when turned down low, a matter of considerable importance in the laboratory as in the kitchen. The wire gauze of the old form is now replaced by a finely-perforated iron cap; this and the rest of the iron work being nickel plated. The larger forms of the solid flame burnor, as fig. 2, are of great value when a considerable heating power is required, and we have one of Mr. Fletcher's original burners in use for heating a bath, twenty minutes being sufficient. In conjunction with the solid flame burner, Mr. Fletcher supplies furnace bodies made of fire-clay, one of these serving for the ignition of a small crucible, while the other takes a miniature muffle. The former arrangement we have found to answer well for the fusion of small quantities of silver, and the latter for experiments on enamel photography.

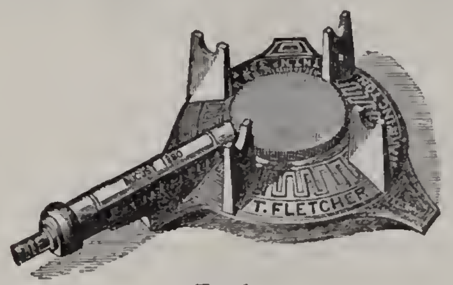


Fig. 1.

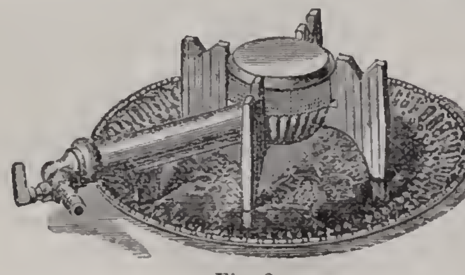


Fig. 2.

Photographic Society of Great Britain.—The next technical meeting of this Society will be held on Tuesday, July 26th, at the Gallery, 5a, Pall Mall East. The chair will be taken at 7·30.

South London Photographic Society.—The Committee have arranged for two out-door meetings to be held during the recess. The first on Saturday, July 30th, at the "Star and Garter," Kew Bridge. A meat tea will be served at 6 p.m., when it is hoped a good muster of members and friends will assemble. Trains from Waterloo, 5·5 and 5·30; from Broad Street, every 5 and 25 minutes past the hour. The Hon. Secretary, Mr. H. Garrett Cocking, High Road, Lee, S.E., should be communicated with before the 27th inst.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best "Reception Room Notes; on Receiving the Sitter and Taking an Order," to be sent in by the 1st August. No name need appear. For rules, see previous numbers of the News.

Dr. Hermann Fol.—You will find that toning either with the so-called *sel d'or* (hyposulphite with gold) or sulpho-cyanide with gold will give a great variety of tone from sepia to deep black.

C. E. G.—You, in common with many others, expect too much from an acetate toning bath. When an old bath has been put by for three months and has become ropy, you may regard the liquid portion as valuless. Preserve any gold which may have been deposited, throw away the liquid portion, and make up a fresh solution.

Dartmoor.—All depends on the temperature at which the solution was saturated. At 56° C it is soluble in its own water of crystallization, so that one part with five of water would then give what you require. As a matter of practice, however, you had better proceed as follows:—Load one end of a varnished pen-holder stick, so that it will float upright in the usual solution, four ounces to a pint, and then make a mark on that part of the stem which cuts the surface of the solution. Now mix some of your so-called saturated solution with water, until the extemporised hydrometer floats to the same point, and note the proportion of water required. The whole operation takes less time than writing the description; and if you happen to have an ordinary hydrometer at hand, you will save time by using it.

J. R. G. S.—The process is a secret one, but several methods by which analogous results may be attained have been published from time to time in the Photographic News.

George Carl.—The best way will be to copy by means of the camera in the ordinary manner.

R. H. Bluesdale.—The registration of photographs is undertaken by our publishers; a fee of 1s. 6d. being charged for each subject.

I. G.—Iron sash bars suitable for your purpose are sold by Messrs. Pfeil and Stedall, of Broad Street, Bloomsbury.

G. Turvey.—1. Certainly, the lens you possess is well adapted for photographing a tombstone, and you cannot do better than to use the plates which you mention. 2. We should prefer to build it on the top of the out-building. You will find diagrams in back numbers of the News.

W. W. M.—The picture of the church is a little flat, and probably the negative would be improved by moderate intensification. With the woodland scene you have been very successful, the whole series of lights and shades being well represented. The "curiosity" is interesting, and we would like to have further particulars.

C. B. R.—It would be wrong both legally and morally.

S. S. B.—1. There is no work especially devoted to the subject, but you will find much information in the Year-Book. 2. The length is 8½ inches and the width 6½ inches.

Charlie.—The specimens of work are by no means up to the mark. Carefully study the chapters on Defects and Failures in Captain Abney's "Instruction in Photography."

Beginner.—1. Either strengthen your silver bath, or add less iodizing solution to the collodion. 2. It is protected by a patent, but this circumstance need not hinder you from making experiments with the process.

S. Arnott.—We gather from your letter that the customer simply ordered you to take a negative, and, in such a case, he is perfectly justified in refusing payment until he receives what he ordered.

Optic.—Theoretically, no; but practically, yes.

Smithers.—The light in question exercises a very notable action on a gelatino-bromide film.

Cosmopolite.—As you entertain such a strong objection to taking ready-prepared plates or films, you might try Vogel's collodio-gelatine emulsion.

Ambrose.—The markings arise from the wave of developer being checked or arrested in its onward movement; and if you add a little more alcohol to the solution it will flow more easily.

A City Photo.—The question as to whether you possess a vested right in the light, is a matter requiring legal opinion; but we should suppose that the fact of your studio having only been in existence for three years would tell against you.

Novice.—A strong solution of sodium hyposulphite possesses the property of dissolving a considerable proportion of calcium sulphate, and this circumstance has been taken advantage of in the analytical separation of barium and calcium.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1195.—*July* 29, 1881.

CONTENTS.

PAGE
Variations in the Hygroscopic Condition of Certain Chemicals 349
Portrait Enlargements from Other People's Negatives 349
Substrata. By Captain Abney, R.E., F.R.S. 352
By-the-Bye—With the Camera on the Continent 352
Notes 354
Topics of the Day—Carbon Transparencies for Enlargements. By H. J. Burton 355
French Correspondence. By Leon Vidal 355
How to Make Emulsion in Hot Weather. By A. L. Henderson 356

PAGE
Preliminary Note on the Photographic Spectrum of Comet *b* 1881. By William Huggins, D.C.L., LLD., F.R.S. 357
A Safe Light. By A. J. Brown 357
Note on the White Opalescent Precipitate which often Forms on Gelatino-Bromide Plates. By S. Geoffray and V. Roux 357
Correspondence 358
Proceedings of Societies 359
Talk in the Studio 359
To Correspondents 360

VARIATIONS IN THE HYGROSCOPIC CONDITION OF CERTAIN CHEMICALS.

In a recent article on weighing and measuring (page 146 of the present volume), we called attention to several sources of inaccuracy which may attend operations of this nature, and we promised to give particulars as to the circumstances under which some of the more important solid photographic chemicals can be obtained in a definite and constant condition as regards the proportion of water present. Our remarks will, however, be confined to those compounds which the photographer is likely to require in accurately-defined or exactly-known quantities.

Ammonium Bromide.—Although the crystals are anhydrous, they are liable to absorb and retain a notable proportion of water. When, however, the salt is powdered, and spread out in a thin layer, all this water may be driven off at a temperature of 50° Centigrade.

Ammonium Chloride.—The above remarks apply equally to this salt.

Ammonium Iodide.—This compound is very liable to decomposition, and as it occurs in commerce it is very liable to contain a variable amount of moisture. The best way of drying it is to spread it in a thin layer on a flat dish, and to support this over a similar dish containing anhydrous calcium chloride. Both dishes are now covered with a bell jar, the edge of which fits closely on to the surface bearing the dishes. Several days are required for the thorough desiccation of the compound; but the operation may be expedited by placing the dishes under the receiver of an air-pump and exhausting the air. Light should be excluded in either case.

Barium Bromide crystallizes with two molecules of water, this being completely driven off when the salt is exposed to the heat of the hot water oven. In drying a salt of this kind it is well to weigh the dish containing it from time to time, and, as soon as no further diminution is found to have taken place, the drying may be considered complete.

Barium Chloride.—Like the bromide, this salt crystallizes with two molecules of water, and its desiccation may be effected as in the case of the bromide.

Barium Iodide.—This salt crystallizes in deliquescent needles containing seven molecules of water of crystallization. The best way of obtaining a definite amount of this compound is to dry the crystals *in vacuo* over calcium chloride, and to allow for the presence of the seven molecules of water.

Barium Nitrate.—Crystals, anhydrous, but traces of mechanically retained moisture may be removed by heating in the water oven.

Cadmium Bromide.—The crystals when dried *in vacuo* over calcium chloride contain one molecule of water; half of this is driven off at 100° C., and the whole at 200° C.

Cadmium Chloride.—Crystallizes with two molecules of water, but can be readily made anhydrous by fusion in a porcelain crucible.

Cadmium Iodide.—The crystals are anhydrous, and the salt may be obtained free from traces of water by cautiously fusing in a porcelain crucible.

Calcium Chloride.—Contains six molecules of water of crystallization, this being best removed by heating the salt to a temperature approaching redness.

Potassium Bichromate.—Contains no water of crystallization, and may be dried in the water bath.

Potassium Bromide.—Anhydrous crystals, from which any trace of hygroscopic moisture may be driven off at 100° C.

Potassium Iodide.—The above remarks apply also to this salt.

Sodium Carbonate—The commercial salt contains 10 molecules of water; but this is readily driven off at a temperature of 100° C.

Silver Nitrate.—The crystals of this important salt are anhydrous; but traces of water may lurk in crevices. This may, however, be effectually expelled by coarsely powdering the salt and heating it to 100° C. in the water oven for an hour or so. A more expeditious proceeding is to fuse the salt in a porcelain crucible; but unless the heat is very cautiously regulated, some portion of the nitrate is liable to be decomposed, oxygen being driven off, and a corresponding proportion of silver nitrite being formed.

Sodium Chloride.—Anhydrous crystals; but very prone to retain hygroscopic moisture, and this is best driven off by fusing the salt.

Many of the compounds in every-day use by the photographer (as ferrous sulphate and sodium hyposulphite) contain a large proportion of water of crystallization; but very often it is impracticable to drive this off without inducing some change, or the exact amount of water present is unimportant in the case of all ordinary processes.

◆

PORTRAIT ENLARGEMENTS FROM OTHER PEOPLE'S NEGATIVES.

There is a particular question which arises again and again to vex the spirit of the professional photographer. It is this: A gentleman or lady has, at one time or another, honoured a photographer by sitting; the patron orders a certain number of prints, and the negative, no longer required, has been registered and put away in the usual manner. Years pass on, and the customer, for some reason or other (he may have removed out of the district, or he may wish for a change), prefers to go to another photographer for his next sitting; but somehow he is not pleased. He likes the enlargements he has seen at Photographer No. 2, and the way in which they are finished; but he does not like this second batch of small portraits that has been sent him. In all probability they are taken quite as well as Photographer No. 1 did the work; but, unfortunately, the patron has grown older, and, when he compares the second portrait to the first, he is anything but satisfied. So he says to Photographer No. 2, "I wish you would execute me an enlargement of my old portrait, finished like the enlargements I see here. I daresay I can borrow the negative for you from Photographer No. 1, for I know he has a habit of keeping them." To this, of course, Photographer No. 2 consents; and then arises the every-day difficulty which, as we have said, causes so much heart-burning in the profession. Photographer No. 1 could do an enlargement of the negative quite as well as No. 2; but he is not asked to do this—he is asked to *lend* his negative.

Under these circumstances, what should be done? Should there be a fixed fee payable by Photographer No. 2 to Photographer No. 1, the amount of fee being based on the charge per dozen of cartes or cabinets? Should photographers lend their negatives one to another simply in the way of courtesy, or should they absolutely refuse to part with them? Or would it be well for Photographer No. 1 to give up the property altogether for a consideration? We have asked the opinions of several gentlemen on the question, and this is what they say:—

An active member of a West End firm says:—

"Many photographers make a speciality of a certain kind of enlargement, differing, perhaps, from that made by the photographer who took the original negative; or a person may like to have a picture made to match another already done; and it does seem a pity that some arrangement cannot be made by which photographers would lend to one another a negative for the purpose of enlargement for a certain sum (say a guinea), so that the one having the order could then elect whether he would pay that sum, or prefer to bestow an extra amount of work entailed when copying from a printed picture. The one taking the original negative would then reap a certain profit; he would otherwise certainly lose, as the picture is always made from the print when the loan of the negative is refused. This arrangement is already made between many photographers, and it seems it might with advantage be extended."

A gentleman who dates from one of our fashionable watering places says:—

"You know very well that I am always ready to help my brother photographers whenever opportunity offers, but I do not go so far as to allow them the use of my negatives. I have too much respect for my art to carry the principle of lending negatives to the extreme. Let us suppose a sign painter who had got an order for a sign, to ask J. E. Millais, R.A., to do the job for him, and sign it with the sign-painter's name. If the principle of lending negatives be admitted, a man who simply cares for the art as an easy means of earning his bread and cheese would be open to ask one of the heads of the profession for the loan of his choicest negative, would send it to a trade enlarger to be enlarged, and perhaps, in his ignorance, touch up the enlargment himself, knock all the beauty out of it, sign his name or paste his trade label on it, and sell it as his own. My practice is perhaps a peculiar one. I undertake difficult subjects, and enjoy them. I also charge a proper professional price for my work. Let me illustrate: a difficult sitter has been the round of the cheap photographers (the 6s.-per-dozen abominations); she (it is nearly always she) is not satisfied, and comes to me. I charge her a guinea, but I undertake to please her. It occasionally happens that I spend 30s. in earning the guinea, but I do this cheerfully; it is all in the day's work, and it averages well. The result usually is that I take this difficult sitter in the precise expression that pleases her best, and which I defy the cheap uneducated 6s. per dozen man to succeed in doing. I obtain a negative that the sitter thinks invaluable. Now you ask, shall I lend this negative to the little trader? And I answer, Certainly not. Liberty, equality, and fraternity, to say nothing of communism, may suit the purposes of those who own nothing—and the cheap man has seldom anything to lend in return—but I cannot see the fun of dividing the profits of my peculiar skill with the cobbler or tailor who has set up a camera; or even with the employer of labour who knows nothing of photography or art himself, but keeps an operator and printer, and writes 'art photographer' after his own name, and wears a smoking-cap because he thinks it looks artistic."

This is the voice of a Board of Directors:—

1. No doubt the proper course would be for Photographer No. 2 to refer his customer back to Photographer No. 1 for the enlargement. I think No. 1 would not be found so ready to part with his negative to another photographer, even for a consideration; but clearly he is entitled to something for it, and the probability is that he would ask such a sum as would make it advantageous to the patron to employ him in preference to No. 2. But I do not think it would be possible to fix a scale of fees for the use of a negative, nor do I believe photographers would be disposed to lend their negatives one to another by way of courtesy."

A Regent Street firm of high rank says:—

"I never lend negatives except to personal friends. Why should I keep the same for years, to give another the opportunity of making perhaps three times as much as it has produced me? No; the sitter can have a plain print if he wishes, so that Photographer No. 2 may enlarge it; but if the negative itself is required, it must be purchased."

A well-known name in Lincoln was written at the bottom of this opinion:—

"A fee for the loan of the negative, or the purchase of it, if agreeable, is the best solution of the problem. I have frequently sold negatives under these circumstances for a guinea. Last year I obliged a brother photographer, north of the Humber, with the loan of a negative, and this year he has been enabled to return me the compliment, in both instances for enlargements."

From a Bond Street studio we receive this reply:—

"I think the fee to be paid to Photographer No. 1 for the loan of his negative should be governed by the price obtained for the enlargement by Photographer No. 2, and this fee should amount to one-fourth of the price so obtained by No. 2; that is, Photographer No. 1 ought, as a matter of simple justice, to be allowed to participate in the profit made out of his negative by No. 2. I think it unreasonable to expect a photographer to lend his negative to another photographer as a matter of 'courtesy.' With respect to the last query: 'Should he give up his property for a consideration?' This must depend on the position of the photographer: if he is doing a small and cheap business, let him sell the negative for the best price he can obtain; if he is doing a larger business, and can command the assistance of the best class of artists, I should say, let him not part with it except upon the condition of the one-fourth share as above mentioned."

A voice from Baker Street says:—

"I never object to lend a negative to any well-known, respectable photographer, that I know will do fair justice to the original. For this reason I have, with one or two exceptions, had the utmost courtesy shown me when asking for the loan of a negative, and I have generally had it sent to me 'with compliments.' I have several times had occasion to borrow negatives from a photographer of repute who has a fixed rule of charging 10s. 6d., which is very reasonable! The best arrangement would be to charge £1 1s."

From a first-class studio in a summer resort we learn :—

"The question cannot be answered off-hand; much depends on the circumstances. For instance, I should want to know into whose hands the negative was to go; if to a local rival photographer, I should decline to either lend or sell; but if the photographer lived at a distance, and in no way came in collision, I would probably be inclined to treat, for a reasonable fee, for either the sale or loan, especially if the said photographer would arrange to treat with me under similar circumstances. I have many times lent negatives under these conditions, and have charged sometimes a guinea, sometimes half-a-guinea. I have also borrowed under similar conditions; but I have also been refused, very rudely sometimes, when I have made such a proposition. It is a question surrounded with difficulty."

A well-known firm in Liverpool writes :—

"In reply to your enquiry respecting 'enlargements from other people's negatives,' we have generally found a little courteous interchange in these matters answer our purposes. We frequently lend our negatives to respectable photographers who apply, and sometimes we send a transparency, and we have frequently been obliged by the loan of their negatives in return. We have seldom found a *respectable* photographer refuse a request courteously made. The only instances we can remember where we have met with a refusal, were in the case of two photographers of no very great standing in the profession. Again, we have occasionally suggested to the persons favouring us with an order for enlargement the purchase by them of the negative; and where the picture was of importance, the payment of a guinea for the negative is not a serious consideration. But in the face of any difficulties that might arise in this matter, there are competent artists who can now work up a copied carte in such a manner that the absence of the original negative is not discernible. Like most matters of business, the buying, borrowing, and lending of negatives is a matter for arrangement, and we do not think any fixed rule can be laid down, or would gain general acquiescence."

A leading Edinburgh photographer says :—

"The subject is rather a difficult one to deal with, but one in which I think all photographers must feel interested. It has always been repugnant to my feelings to sell my negatives, but there are times and circumstances when we may safely do so without fear of losing further orders. I have myself for several years lent and borrowed negatives at the rate of 10s., when the order was for (say) a £10 enlargement; but I think when an order for a larger sum is secured, then £1 would be a fair charge. But there are photographers who will neither do one nor the other. I will give you a case in point. A few years ago I had for customer a gentleman of independent means who gave me some good orders. One was for an enlargment from a small photograph which pleased him so much that he gave me a further order to make another enlargement from a C.D.V. to match. This carte had been taken by a London photographer, and as I was about to visit London, my client gave me a note authorizing me to give one guinea for negative, assuring the photographer that no further copies would be required. It was clearly this photographer's interest to sell, but he did not, and would not lend it for 10s., or any sum; instead, he wrote to my client and offered to do any work he might require, &c. &c. The result was, I copied the carte and did the enlargement, which gave great satisfaction. My client saved a guinea, which this distinguished London photographer might have pocketed, and didn't. In lending a negative, I would have a written agreement that the negative was to be returned in so many days, and not to be used for any other purpose but what it was borrowed for, *i.e.*, enlarging, and only for private individuals, and not for wholesale distribution. With this agreement I think there should be no real difficulty in the way of borrowing, careful packing being adhered to, and carriage paid, and in case of breakage through post or otherwise, one guinea should be paid the lender. I would not lend my negative to any man who chose to ask, but only to those that I thought would do my negative justice. I have sometimes sold a C.D.V. negative for one guinea, when it was clear to my mind that I should make the best bargain by so doing, and I have invariably been right. If a photographer did not like to trust the negative, he might make a carbon transparency, and send it instead; probably this would be the better plan."

Glasgow, like the courteous cabman in *Punch*, "will leave it to us."

From Manchester the following opinion is recorded :—

"For the loan of a negative for the purpose of enlargement, a fee in accordance with the value of the negative might be charged. In the case of photographs being brought to be copied the same size only, the original photographer should be willing to forward unmounted copies at a nominal price to the photographer receiving the order, thus doing away with the wretched productions that result from copying a faded, cracked, and greasy print."

A busy City photographer says :

"The matter requires great consideration, and the decision must be governed to a great extent by the personal experiences of the interested parties. In the first place, regarding the keeping of all negatives, my books prove that not only do carefully kept, registered, and numbered photographs bring in a large income, but that more profit is derived from one day's orders than would pay a month's glass bill, not considering the labour of cleaning off films nor the difficulty of getting clean pictures on old glass. My stock of negatives cannot be far short of 250,000. Next, as to selling negatives. For instance, take the negative of a notorious runaway for the apprehension of whom a reward of £200 is offered. How easy it might be for some one to purchase the negative for a few shillings, then flood the market with proofs to the tune of about fifty or hundred thousand, thereby depriving the original proprietor of a valuable consideration! A client of mine for enamels once sent me a paper proof of an M.P., from a negative by a London company, with the request for me to purchase the negative. Now it so happened that the Irish photographer had several good negatives of the said M. P., but the latter did not like them so well as the one taken in London. I purchased the negative for 21s.; the M.P. afterwards presented his constituents with a copy each. I think the Irishman got the best of the bargain. A lady brought a card for me to enamel; the negative was taken by a Torquay photographer. I wrote to him asking for a loan of the negative, offering my usual discount, viz., 33 per cent. I received a sharp reply, refusing. As the proof was good, I had no difficulty in producing splendid results. My customer was so pleased that I obtained a thirty guinea order; consequently my sharp friend lost ten guineas. As an extenuating circumstance, he may have been served out something in the way your humble servant was. A photographer asked me to lend him a negative to produce a cheap enlargement from. I lent the plate free of charge. I subsequently found out that the cheap enlargement amounted to three copies at thirty pounds each. As a rule, I find that the better the photographer, the more likely he is to lend the negative. I always give an undertaking that it is only to be reproduced on enamel. Need I say that I have almost a monopoly in enamels in England? I can afford to retaliate, and do so by refusing to produce them for my disobliging brethren. In conclusion, I consider that if any universal understanding upon any kind of basis could be arrived at, and which every photographer will strictly adhere to, then will be the commencement of the millennium.'"

Bristol says :—

"I should certainly refuse to lend or sell a negative to any one for the purpose of making an enlargement by another photographer, neither should I expect any other photographer to lend or sell me a negative. I send out no enlargements but what are finished in monochrome or colour (plain, untouched enlargements being very unsatisfactory), and when I am called upon to make an enlargement from a carte or cabinet portrait taken by another photographer, I charge 25 to 50 per cent. (according to the amount of work required to be put upon the picture) over and above my price for an enlargement of the same size made from a negative taken by myself."

SUBSTRATA.

BY CAPTAIN ABNEY, R.E., F.R.S.

In your article on substrata you give some very excellent formulæ, which should answer perfectly with gelatine plates. There is one, however, which you have not put forward, and which, of all I have tried, is a better and cleaner one than any. It is one lately published by Dr. H. Vogel, the principle of which I only remembered at the time I used it, and the proportions I used are not, I find, quite the same that he gives; but as my own have answered, I hold to them.

The substratum is formed as follows :—

Place (say) 50 grains of gelatine in a flask, and add to them a little acetic acid (it is not necessary for it to be glacial); warm in boiling water to dissolve the gelatine. Keep adding acetic acid till solution is secured. It is not very particular how much you add, so long as it is sufficient. When dissolved, make up to about 5 oz. with ordinary methylated spirit. At first the solution remains opalescent while the alcohol is added, but at a well-marked point it becomes white, due to the precipitation of the gelatine. No more spirit must be added at this stage, but more acetic acid must be dropped in till the white curdy appearance is lost. The liquid should be heated to aid the re-solution. A grain of chrome-alum dissolved in 1 dr. of water must next be added. You then have a fluid which, when poured upon a glass plate, gives a most excellent substratum. To use it, filter through paper, and coat the plate as with colllodion; return the excess into the filter; rock the plate to do away with lines, and dry over a Bunsen burner, or a spirit lamp, or before a fire. The alcohol will rapidly evaporate, and then the acetic acid is driven off, and a glassy, hard substratum remains on the surface of the plate. Dr. Vogel, I believe, says the plates are to be dried spontaneously; but if so, half the valuable qualities of the substratum will be lost. The rapid drying prevents any dust falling on the plate and being embedded in the substratum.

Vogel recommends this substratum for use with his aceto-gelatino-bromide emulsion, which can be prepared, by-the-bye, in identically the same manner as that given above for the substratum, using gelatine pellicle instead of the gelatine, and in my hands it answers well. There is no danger of the film slipping or frilling when it is used, and consequently there would be much less chance of an ordinary film frilling, since the said emulsion is a terrible article to keep on a glass plate at any time.

My chief reason in writing on this substratum is to call attention to the admirable way it is adapted to ordinary collodion dry plate methods. Collodion plates which have received a coating of aqueous substrata are always liable to have markings in them, however carefully prepared. Comet-like markings are, for instance, often met with. I recollect perfectly well the difficulty we had to get plates free from this defect during the Transit of Venus photography. Had the above been known, much difficulty would have been avoided. With collodion emulsion plates, when a preservative of albumen mixed with other substances was used, it was very difficult to find a substratum which would hold at all. Now we have one which is perfect, and gives no markings.

In the wet process where a substratum is used, or in bath dry plates where development takes place by means of deposition of silver from silver nitrate, the faults in it are not so apparent, since the image is chiefly formed on the surface of the film of collodion. Where alkaline development is used, any defect in the substratum is at once apparent. My remarks not only apply to home-made plates, but also to plates which were supplied commercially before the advent of gelatine plates.

The substratum may also be used as a preservative for collodion dry plates; undiluted and un bromised developers can be used with such. Before applying the preservative, the plate after washing (if washed) should be dipped in methylated spirit and water (5 to 2) in order to make the gelatine solution flow. I think it will be found that we owe to Dr. Vogel another to our many debts of gratitude.

By-the-Bye.

WITH THE CAMERA ON THE CONTINENT.

Gelatine plates are likely to add to the number of tourists who journey with a camera, and many a traveller bent on paying a visit this year to Switzerland, the Black Forest, or the Tyrol, will carry with him photographic apparatus, in the endeavour to bring back a pleasant reminiscence of his trip; and let us tell our readers that no more charming *souvenir* of a summer's outing, especially upon foreign soil, can be obtained, than photographs taken by yourself on the spot. Purchased pictures are another matter altogether. They may be like the lake, mountain, or village as we ourselves have seen it, or they may not. The photographer himself, on the other hand, has seen and admired the object precisely from the very point of view he has chosen in his picture; and not unfrequently every negative has its history, to be vividly called to mind whenever we gaze upon the picture. Where friends see but a quaint Tyrolese châlet in your picture, with carved balcony and stone-weighted roof, you are reminded, possibly, of a famous skittle party among the villagers, in their sugar-loaf hats and embroidered braces; or possibly of an evening with the zither, when the trim waiting-maid, in her short blue skirt and neatly-braided hair, having attended to your creature comforts, seated herself in the balcony, and, with plaintive voice and clear-ringing falsetto, sang, " Die Berge von Tirol."

And here one word of advice as to the choice of objects which will afford the best *souvenirs* of a tour on " the Continong "—and it is advice, we may mention, put forward after repeated visits to the Beauty Spots of Europe. It is this: Rather than depict the waterfalls, the lakes, the mountain peaks, and other natural beauties, select characteristics of the place and people. A waterfall, be it ever so gigantic, a peak, ever so high, a lake, ever so broad and placid, do not afford such trite reminiscences as objects to do with village life and personal customs. Thus an old church, a quaint farm-building, a public fountain, an old-fashioned hostelry, a crooked street, a mediæval town-hall, a country stile, a pair of rival Custom-houses on the frontier, a lumbering post-waggon—such things as these, which have a local history, and are inherent to the country, will be found far more profitable investments with the camera than woodland or covert, however beautiful, since the latter are to be found alike in many countries.

We have never journeyed with other than dry plates, and we may mention, for the information of those inexperienced in travelling on the Continent with photographic apparatus, that we have never met with difficulty in the passing of packages through the Customs. Our plates were first packed in either fours or sixes, and these small packages then put together. An order to undo the packages was rarely given. The only instance in which we remember to have had any trouble was at the Copenhagen Custom House, when on our way to Norway; but here the officer was satisfied with an explanation that the plates would be useless if opened to the daylight. At Isella, on the Simplon route and the first Italian village, where a serjeant and three *gens d'armes* are located, their muskets hung up in formidable array outside the guardhouse, we were once delayed and instructed to exhibit the whole of our apparatus. But the reason of this, we afterwards found, was not to satisfy the exigencies of the State, but because the serjeant personally took an interest in photography. Still, always keep your packages small, is a maxim to be remembered.

Gelatine emulsion plates, strange to say, do not seem to be so much affected by the sea air as collodion emulsion, to which our experience is confined. At the same time it is obviously very desirable that a body like gelatine, which is so susceptible to damp, should be guarded as jealously as possible from its influence. Our plan, after wrapping in orange and black paper, was to envelop the package in caddy tin, a thick tin-foil, which is less subject to tearing than the ordinary material. In two of our Continental journeys—once to the Tyrol and once to Thuringia—we carried the Warnerke dark slide, with tissue upon the rollers sufficient for forty pictures, and the results we obtained, as well as the gleanings of other holiday rambles, some of our readers may remember to have seen a short time ago at the Photographic Society, exhibited in illustration of a paper on "Photography from a Holiday-maker's Point of View." The Warnerke tissue we found to possess one very great advantage beyond its portability, &c., over our ordinary dry plate outfit, and for this reason it is to be hoped that the day is not very distant when we shall be able to employ gelatino-bromide in the form of tissue; the advantage was that you had no anxiety about husbanding your sensitive material. Supposing you had two double dark slides, and allowed yourself four plates a day, you were always anxious, on the one hand, lest you should throw away a film on an undeserving object early in the day; and on the other, that all your plates should be exposed at the end of the day, for packing or repacking odd plates is indeed a trouble. With a roll of tissue, however, you may make five, six, or seven exposures one day, and none at all the next, if it so please you.

Since our tours were made for the most part with the knapsack, the question of carriage was all-important, and only from three to four dozen 5 by 4 plates were the utmost we could carry. No dark box or bag found a place in our outfit, so we were led to all sorts of shifts and contrivances to change the plates in the dark. In Norway, a most ludicrous incident befell. Our first batch of plates were exposed, and as evening came on we prepared as usual to make the change under cover of the night. Suddenly it struck us we had reckoned without our host. Night came, but no darkness; you could see to read throughout the four-and-twenty hours. So the unpleasant plan of being half stifled in a cupboard during the changing operation was once more resorted to.

We had another good reason for remembering the brief nights in Norway, and a little landscape picture we have brings the circumstance still vividly before us. Our pedestrian party lost itself crossing the Scandinavians, not very far south of the Arctic circle. We well remember the scene. In front stretched an endless moorland, covered here and there with broad patches of white—congealed snow or glacier—and intersecting the country in all directions were rapid torrents and brawling streams to impede the traveller's progress. It was like a deserted laundry-ground on a gigantic scale. As you plodded onwards across this silent kingdom of desolation, hour after hour, for ever surrounded by brown moorland, glaciers, and snow-fields, by noisy torrents and broad lakes, the solitude and loneliness began to enter your very soul. An endless wilderness was all around, and, save the sound of rushing waters, there was nought to be heard but the mournful notes of some marsh bird—a sort of plaintive whistle maintained incessantly day and night—a sound so dismal and monotonous as further to depress one's spirits, and render desolation still more desolate. We had, indeed, lost our way, and there seemed no prospect of finding it again. We toiled wearily on, trying to sight a hut or habitation; at last one of the party more tired than the rest suggested a halt. "Come to the top of that eminence and see the last of the sun," he said. We climbed up and watched the burning orb sink down into a lake of purple and gold. We ate a biscuit or two, chatted over our misfortune a little while, and then prepared to descend. "Wait a minute, here is the moon coming up; we might as well see it." We waited—up it came as red and fiery as before. But it was not the moon, it was the sun once more that came to tell us another day had begun, and that we had lost our chance of a bed for the night.

There are several spots where photography and sketching are alike forbidden—to wit, in some of the defiles of North Italy and Austria. Not long ago we were warned out of the magnificent Finstermünz Pass by a zealous sentry, because we set up our tiny camera in the neighbourhood of the massive fortress that bars the way southward. This taught us to be careful in future, and as nearly all the big valleys in the Tyrol are guarded not far from the frontier, the lesson was not thrown away. The German and French Government do not permit photographers near their fortresses, but as these are usually situated in uninteresting spots, trouble is hardly likely to arise from this cause. Mr. England was once arrested on the Rhine with his camera, but this was in 1870, just as the war between Germany and France broke out. To be taken as a spy is not enviable under any circumstances, and more particularly when they get into the habit of shooting you first and trying you afterwards. In Mr. England's case martial law seems to have been satisfied by leading him to the frontier and discharging him.

In photographing in the South (and especially by the Italian lakes, or upon the snowfields of the Alps) the flood of light is frequently very distressing. After staring at crystal glaciers of glittering white, with the clearest of blue skies above, the eyes get quite untrustworthy, and darkness seems to intervene. We have stood behind a camera on the Mortarasch Glacier, in the Engadine, on a cloudless day, rubbing our eyes and scarcely knowing whether it was dark or light; and this, too, with blue spectacles to protect the sight. In a word, the light loses its excessive brilliancy to the retina. Mr. England's practice of always employing a peak to the lens, which shuts out the glare, just as the peak of a cap shields the eye, is an arrangement that cannot be too highly recommended, and it may, if suitably used, be made to counteract the shortcomings of the ordinary drop-shutter.

A diary should always be kept of each exposure. In some of our late travels we had the good-fortune to travel with a clever draughtsman, who was kind enough to make a rough pencil sketch of the salient features of the view; this was of great assistance afterwards, when developing the details of the picture. For when it comes to developing three or four dozen plates a month after they have been exposed, a little prompting is very essential; otherwise, it may not be until the detail has come and partially gone again, that the true nature of the image is recalled to one's mind. The character of the light, the time of exposure, and the size of the stop are three items that should obviously be noted, unless the plan is adopted of estimating the exposure by arbitrary figures, such as 1 to 4. A man who is familiar with the lens he is using will learn to make a very good guess of the value of his exposure, and, according to the light at the time being, and the period of exposure, he will enter against the plate in his book, the figure 1, 2, 3, or 4, signifying the value of the exposure in his judgment. We are not so sure whether this plan, seeing the uncertainty of the factors with which a photographer has to deal, is not, after all, the simplest and best a traveller can resort to.

The "At Home" next week will be, "In Princes Street, Edinburgh." The following "By-the-Bye" will be, "A National Photographic Gallery."

Notes.

Good news comes from Mr. Woodbury, who is just now in Brussels, still hard at work at his new Stannotype process. "He will be a sharp man who can further simplify this process," he writes. "My latest addition is coating my tinfoil with steel, before pressing it in contact with the gelatine image, by which I hope to get 1,000 or more prints from one mould. The electrotyping, composition, &c., are all thrown on one side."

Mr. Woodbury, fortunately, secured permission to carry on his experiments in the "Cave de Musée," for with a temperature at 94° F. in the shade, little can be done with fluid gelatine. In his quarters in the Museum cellar, however, the thermometer never rose above 69° F., and printing was never interrupted.

A letter from Sfax states that before the French landed, they carried on the bombardment at night, aided by the electric light, and using guns of large calibre. The French have for a long time past occupied themselves in devising an effective plan of night bombardment, and now appear to have succeeded. Napoleon III. encouraged the late M. Chevalier in some experiments in this direction, at Vincennes, in which both the camera and theodolite were brought into requisition.

The Chevalier photographic plane-table was adopted in the French army some years ago, and M. Chevalier, at the time of his decease, was working at two military problems, which, with the aid of photography, he pledged himself to solve:—(1) By employing two photographic proofs obtained with the instruments to regulate in the most certain manner, during the night time, the direction of fire against an enemy's works, as likewise the angle of reflection of the electric light to be used for illuminating the same; (2) In like manner to regulate the convergent fire of either one or more batteries, as well during the night as during the day. It would be interesting to know what plan was followed in the recent night bombardment of Sfax.

This week we present our readers with a novelty; it is the discussion of a subject that is of importance to every professional photographer, by several competent authorities. If others desire to speak, we shall be very glad to give them a hearing; meanwhile we may assure our readers that the opinions we quote are all those of leading men in the profession.

The metropolis, both West End and City, are represented in our correspondence, together with Edinburgh, Glasgow, Liverpool, Manchester, Bristol, and Lincoln. Voices come to us from fashionable resorts, and from the biggest employers of photographic labour, so that opinions of all sorts are before our readers. Still, with all the discussion, the question of making use of other people's negatives seems as far off settlement as ever.

The Vienna photographers are all talking about Adèle's new studio, which is said to be very handsomely appointed

Photographic forgeries are still rife. Some spurious fifty-florin notes having been abroad for some time, the German police made a descent upon the premises of a photographer named Geibler, who has a studio in the Wall Strasse, Berlin. The notes purported to be Austrian, and were so accurately copied that they passed without difficulty. The Berlin police took charge of studio and apparatus; but the principal was not forthcoming. An accomplice, a photographer named Borr, of Dresden, was, however, captured; but he does not seem to have had a hand in the production of the notes.

The very small type upon German notes, which has hitherto been deemed a safe-guard, is really in favour of photographic forgeries. Of late, many of the English banks have followed suit, and adopted microscopic printing over a portion of their cheques, and this, notwithstanding the fact that it is in colour, we regard rather as an aid than as a difficulty to the photographic forger. He can have large type set up of a similar character, and, having produced a photo-type in miniature, print off in any colour that pleases him; and this printing over covers many defects. Due care in the manufacture of the paper and in the printing appears, after all, the best safe-guard, for it is patent that Bank of England notes, which are simply black and white, have not been forged for many a year.

Hyposulphite solution added to the oxalate developer, as suggested some time since by Captain Abney, does far more than improve the clearness and brilliancy of a negative. It is a wonderful accelerator if you only use enough. Make an experiment of this kind. Expose four plates ten feet from a fish-tail burner, for the period of a minute, under one of Warnerke's screens or sensitometers. Then develop in each case with half-an-ounce of a saturated solution of ferrous sulphate mixed with three half-ounces of a saturated solution of potassium oxalate.

Develop No. 1 plate with the mixture alone; No. 2 with twenty drops of hyposulphite added; No. 3 with fifty drops; No. 4 with 100 drops, the hyposulphite solution being of the strength 1 to 200. The result will be that plate No. 4, as regards detail and density, seems to have had ten times the exposure of No. 1. We almost doubt whether pyrogallic development can be rendered as energetic as oxalate, when a sufficiency of hyposulphite is added.

Nota Bene.—Too much hyposulphite or too much development will bring about a reversal of the image, even if this is under-exposed.

We regret to announce the death of Mr. Daniel Downey, a member of the well-known firm of Messrs. W. and D. Downey, of Ebury Street.

The Congress of German photographers, announced for next month at Franfurt, will not take place. The apathy exhibited by the Societies throughout the Fatherland, is given as the reason for its abandonment.

Mr. W. H. M. Christie, first assistant at the Royal Observatory at Greenwich, will probably be the new Astronomer-Royal when Sir G. Airy vacates the appointment in a few days hence.

Milan is actively preparing for its Exhibition in September, in which photography and photographic appliances are to take a part. Milan is so near the Italian lakes—but a couple of hours' journey from Como—that tourists in the vicinity should bear the gathering in mind.

A penny each, or two for three-half-pence, is the price of some collotype prints we have recently received in *papier maché* frame, and ring attached, ready for hanging. The pictures measure six inches, and the dimensions of the frame are about ten or twelve, Our examples are from paintings in the Dresden Gallery, and include Rembrandt's "Breakfast," Raphael's "Madonna," &c. Verily is photography the handmaiden of art.

Topics of the Day.

CARBON TRANSPARENCIES FOR ENLARGEMENTS.

BY H. J. BURTON.

Notwithstanding the various processes that exist of making enlargements, there can be little doubt but that the one in which an enlarged negative is made from a carbon transparency is the best. From a practical point of view, as well as in the quality of the result, no other method can surpass it. Of first importance is the transparency; every thing depends upon its quality. Nothing can excel a properly prepared carbon transparency; its wonderfully delicate gradations, brilliancy, and structureless character, fit it in every way as the source from which the most perfect results may be obtained.

When the late Mr. Window—who was the originator of this method of enlarging—exhibited carbon enlargement at Conduit Street, more than a dozen years ago, it was then believed that a great advance had been made, and, judging by the enormous number of enlargements that are turned out by the Autotype, Woodbury, and other houses, there can be no doubt about it. In estimating the value of the process, it is easy to see why it has retained its place so long, and bids fair to do so in the future. By contact printing, the transparency registers the full sharpness, without the wiry sharpness of camera printing; and printing right out is important as securing the relative contrasts of original; but we have the power of exaggerating the contrasts when necessary, as well as being able to secure a soft transparency from a hard negative, and the simplicity and certainty of manipulation combine to make it a most useful process. Exceeding care in straining the wash water from impurities and preventing dust from settling, are moreover important conditions.

It will be admitted that wet collodion is the most simple as well as suitable for large plates; and the results not to be surpassed by any other method.

We will condense in a few remarks the making of enlarged negatives by the process under discussion. Prepare plates in advance, with a substratum of gelatine and bichromate of potash, four per cent. of the former to one quarter per cent. of the latter; use a tissue prepared with filtered china ink, and sensitized by immersion for three minutes in a five per cent. solution of bichromate of potash, containing a quarter per cent. of liquor ammonia. Print out well, and coat with collodion (ordinary iodized collodion will do), and dry. Lay in cold water, and transfer to one of the prepared plates, using a squegee to expel the excess of water; in ten minutes immerse in warm water, remove the paper, and continue laving the water upon the plate till the colour ceases to run away; rinse in cold water, and dry free from dust. Supposing the original negative to be flat, the transparency will be wanting in contrast, which may be remedied by immersion in a very weak ammonia nitrate of silver solution, washing, and applying the ordinary pyrogallic intensifier much diluted. For very hard negatives use a tissue some days old, and print in the sun. A suitable transparency having been obtained, making the negative becomes an easy matter.

The "Topic" for next week will be "Stops," by Mr. H. Wilmer.

FRENCH CORRESPONDENCE.

Exhibition of Engravings at the Library Club—Gelatino-Bromide Plates of Unknown Manufacture—Stannotype Process of Mr. Woodbury—Enamelled Photographs—Hostility to the Ferrotype Process.

Exhibition of Engravings at the Library Club.—The Library Club, which last year held a beautiful exhibition of books, has followed it up this year by arranging a magnificent show of engravings. Having first appealed to the collectors of rare and curious specimens of old engraving, they have applied also to the possessors of modern prints of all kinds, both in monochrome and polychrome. Never before have I seen photography so completely represented in the category of the graphic arts. We find in this exhibition photogravure, plain and coloured, of Messrs. Goupil and Company; heliogravure of M. Dujardin, M. Baldus, and M. Arents; phototypographs of Messrs. Ives and Barret, Gillot, Dante, and Charles Petit; Woodburytypes of Messrs. Goupil and Lemercier; phototypes of M. Quinsac; and lastly, photochromie by M. Léon Vidal, exhibited by the Company of the *Moniteur Universel.* This is the first time that so freely and openly the products of engraving executed by hand have been compared with those produced by the different methods of photography. I cannot but congratulate our profession upon this achievement, for it inaugurates an era long looked forward to by me, of the introduction of photography among the arts of printing. It was, in fact, only reasonable, and the object was one to which we are always approaching nearer; but certain prejudices, giving rise to an opposition which was much to be deplored, have hitherto succeeded in excluding photography from the graphic arts. Up to the present it has always been classed by itself, but this will no longer be possible now that it has been recognized as the most powerful auxiliary of engraving and typographic processes. Nothing proves this statement better than the magnificent catalogue of this exhibition, published by the Library Club under quite special conditions. This catalogue is illustrated by means of all the processes represented in the exhibition, and contains splendid specimens of heliogravure, phototypie, photoglyptie, lithochromie, and typochromie. It forms really a remarkable example of typographic printing, and every page of this big quarto volume shows the important part which is played by photography among the arts of printing. One article contains an account of the history of engraving, and another one of the history of photography, drawn up with his accustomed talent by our esteemed colleague M. Davanne. These two articles constitute the whole of the letter-press of the catalogue, and are the best proof of the intimate union which exists between the two arts on which graphic processes must depend—on the one hand-engraving, which includes drawing, and all the methods depending on manual execution; and on the other hand, photography, from which spring all the automatic methods of reproduction. If at the present moment photographic science has come to a temporary halt, it is only to prepare itself for further and higher advances. We must all recognise how largely our art will gain in consideration, condemned as it was previously to struggle against undoubted and unjust misapprehension.

Gelatino-Bromide Plates of Unknown Manufacture.—It cannot be necessary now-a-days to demonstrate the great advantage which has been conferred upon all photographic work by the introduction of dry gelatine plates; yet it is necessary to put both amateur and professional photographers on their guard against plates of uncertain manufacture. Working with plates of this kind they run the risk of almost certain failure, and it is extremely vexing when, on returning from an expedition, it is found that nearly all the views taken are quite spoilt. I have just myself been exposed to this misfortune: having ordered some of Monckhoven's plates, which had not arrived at the time wanted, I happened, in passing down one of the principal streets of Paris, to see a notice on the door of a shop, "Dry gelatine plates." Entering and questioning the proprietor, I was assured that these plates had been prepared with Van Monckhoven's emulsion, and, relying upon this assurance, I bought a dozen to take with me on an excursion, which I had just arranged with some friends. By good luck I still had left five plates which I had obtained from Van Monckhoven direct, and these were the only ones with which I obtained any success; the other seven, which came from the shop I have just mentioned, turned out to be frilled, and that so badly that I could find no means of restoring them. I tried collodionizing them with raw collodion, fixing them with water at almost freezing point, plunging them in a saturated bath of alum, but all to no purpose. The film split off from the glass, notwithstanding every means adopted to make it adhere. With the five plates of Van Monckhoven's, none of these precautions were necessary. This example alone is sufficient to show how imprudent it is to engage on a photographic expedition with materials which are not thoroughly reliable, or at all events without having tried those which come from an unknown source. This warning is more particularly addressed to amateurs, who are so often completely discouraged by a failure like the one I have just described. Every misfortune has its uses, it is said, and for this reason I have described what happened to myself, that it may be a lesson to my fellow-workers, as it has been to me.

Stannotype Process of Mr. Woodbury.—Our esteemed friend Mr. Woodbury has lately sent us from Brussels a print taken by his Stannotype process, which leaves nothing to be desired, and proves that he has completely succeeded in putting into practice the latest improvements of his new process of Woodburytype, without the use of the hydraulic press. According to this latest method, Mr. Woodbury forms a relief in gelatine with the positive, so that he has a negative developed on the surface of a glass plate. He places on this relief a thin sheet of tin, which is forced into it by the pressure of a cylinder, so as to obtain as perfect a mould of the relief as possible. When this has been done, in order to make the printing surface as durable as possible, he coats the tin with steel, and he thus obtains a plate possessing all the qualities of that which he obtained by moulding; but for this latter process are required much longer and more complicated manipulations, more especially the transfer from one plate to another of the relief previously coated with copper by electrotype. The new method adopted by this skilful inventor avoids these difficulties, but it is necessary to produce a proper positive, and when the mould in tin has been taken, to harden its non-resisting surface by coating it with steel. In this case also the image is not reversed, and the mould will serve for a long time. The print which Mr. Woodbury has so kindly sent me is taken from the same plate which he had used for pulling impressions by the older process. I had at hand some of the prints taken by this process, so that I was able to compare them with the one taken by the positive process. Really the only difference between the two is the position of the object represented, one looking to the left and the other to the right. If it were not for this it would be impossible to distinguish one from the other, so complete is the success realised.

Enamelled Photographs.—The question of the durabilty of photographic impressions continues to occupy my attention. I have observed that the photographs enamelled, or rather glazed by the application to their surface of a double layer of collodion and gelatine, last a much longer time than those in which the albumen is bare. A print in silver chloride, enclosed between two layers of plain collodion, ought to last a very long time, because we thus avoid all direct contact with the air and the damp, and it is to them that any alteration in photographs is due. I cannot, therefore, too highly recommend manufacturers who make prints of this kind for books which are exposed to the fate of growing old in collections and libraries, to take advantage of this precaution of a double collodionizing. The print, thus protected from deleterious agents, may therefore defy the action of time—not in the same way as if it had been taken by the carbon process, but, at any rate, for as long a time as the double varnish with which it is coated is able to stand, and this is not a small thing.

Hostility to the Ferrotype Process.—One word more about the ferrotype. It seems that a journal which respects itself ought not to contain an article describing this process—at least, that is what I am told in return for having sent to the PHOTOGRAPHIC NEWS an account of the details of this interesting process. Of course, I never intended to mean that works of art with any pretension could be produced in this way, but I do not think that the applications of photography should be restricted to those which can only produce wonders. I am extremely sorry that some of my esteemed colleagues feel an amount of irritation on this subject. But as the sun shines for all the world, it seems to me to be right that a professional journal should take as much notice of the photography of the humble, as it does of that of the rich. Not one of these applications should in my opinion be despised; and to remain true to my mission, it seems to me that I may give advice to all that are engaged in photography, whether ferrotype or otherwise, and to endeavour as much as possible to impress on all of them the value of artistic taste.

LEON VIDAL.

HOW TO MAKE EMULSION IN HOT WEATHER.

BY A. L. HENDERSON.

NUMEROUS complaints have reached me within the last few weeks of the difficulty experienced in preparing emulsion and coating plates; one is very likely to blame everything but the right, but doubtless the weather is the culprit.

I have always held that to boil gelatine is to spoil it, and, even when emulsification is made with a few grains to the ounce and cooled down before adding the bulk, the damage is done to the smaller quantity, so that when mixed it contaminates the whole mass; moreover, it is impossible to set and wash the gelatine without the aid of ice.

I have lately made several batches (with the thermometer at 92° in the shade, and the washing water at 78°) as follows:—

Hard gelatine	½ ounce
Water	2 ounces
Alcohol	2 ,,
Bromide ammonia	150 grains
Liquor ammonia 880	60 drops

When all is thoroughly dissolved and of about 120° temperature, add, stirring all the time—

Nitrate silver	60 grains
Water	¾ ounce
Alcohol	¾ ,,

Then again add—

Nitrate silver	140 grains
Water	1 ounce
Alcohol	1 ,,

Both solutions being warmed to about 120°.

My object in adding the silver in two quantities will be obvious to many—viz., when the first portion of silver is mixed, nitrate of ammonia is liberated (which is a powerful restrainer), and the bulk of the solution being increased, the remainder of the silver may be added in a much more concentrated state.

The alcohol, both in the gelatine and silver solutions, plays a most important part:—(1) It prevents decomposition of the gelatine. (2). It allows the gelatine to be precipitated with a much smaller quantity of alcohol (say about 10 ounces).

After letting the emulsion stand for a few minutes to ripen, I pour in slowly about eight ounces of alcohol, stirring all the time, and keeping the emulsion warm; the emulsion will adhere to the stirring-rod and the bottom of the vessel in a soft mass, and all that is now required is to pour away the alcohol, allow the emulsion to cool, tear it into small pieces, wash in several changes of cold water, make up the quantity to ten ounces, and strain: it is then ready for coating.

By this formula I have no difficulties whatever; my plates set in about five minutes, and their quality is such that, "unless a better method is devised," I intend to adopt it in all weathers.

One word more as to the alcohol. It will prevent the decomposition of gelatine when boiling goes on, or when in the presence of foreign salts; no flocculent deposit is noticed in the alcohol after the emulsion has been precipitated.

PRELIMINARY NOTE ON THE PHOTOGRAPHIC SPECTRUM OF COMET *b* 1881.

BY WILLIAM HUGGINS, D.C.L., LLD., F.R.S.[*]

On the evening of June 24, I directed the reflector furnished with the spectroscopic and photographic arrangements described in my paper "On the Photographic Spectra of Stars"[†] to the head of the comet, so that the nucleus should be upon one half of the slit. After one hour's exposure the open half of the slit was closed, the shutter withdrawn from the other half, and the instrument then directed to Arcturus for fifteen minutes.

After development, the plate presented a very distinct spectrum of the comet, together with the spectrum of the star, which I have already described in the paper referred to above.

The spectrum of the comet consists of a pair of bright lines in the ultra-violet region, and a continuous spectrum which can be traced from about F to some distance beyond H.

The bright lines, a little distance beyond H, with an approximate wave-length from 3870 to 3890, appear to belong to the spectrum of carbon (in some form, possibly in combination with hydrogen), which I observed in the spectra of the telescopic comets of 1866 and 1868.

In the continuous spectrum shown in the photograph, the dark lines of Fraunhofer can be seen.

This photographic evidence supports the results of my previous observations in the visible spectra of some telescopic comets. Part of the light from comets is reflected solar light, and another part is light of their own. The spectrum of this light shows the presence in the comet of carbon, possibly in combination with hydrogen.

On the next night, June 25, a second photograph was obtained with an exposure of an hour and a half. This photograph, notwithstanding the longer exposure, is fainter, but shows distinctly the two bright lines and the continuous spectrum, which is too faint to allow the Fraunhofer lines to be seen.

(*Postscript*, *July* 9, 1881).

I have since measured the photographs of the comet's spectrum, and I find for the two strong bright lines the wave-lengths 3883 and 3870. The less refrangible line is much stronger, and a faint luminosity can be traced from it to a little beyond the second line 3870. There can be, however, no doubt that these lines represent the brightest end of the ultra-violet group which appears under certain circumstances in the spectra of the compounds of carbon. Professors Liveing and Dewar have found for the strong line at the beginning of this group the wave-length 3882·7, and for the second line 3870·5.

I am also able to see upon the continuous solar spectrum a distinct impression of the group of lines between G and *h*, which is usually associated with the group described above. My measures for the less refrangible end of this group give a wave-length of 4230, which agrees as well as can be expected with Professors Liveing and Dewar's measure 4220.

In their paper "On the Spectra of the Compounds of Carbon," "Proc. Roy. Soc.," vol. 90, p. 494, Professors Liveing and Dewar show that these two groups indicate the presence of cyanogen, and are not to be seen in the absence of nitrogen. If this be the case, the photograph gives undoubted evidence of the presence of nitrogen in the comet, in addition to the carbon and hydrogen shown to be there by the bright groups in the visible part of the spectrum. On this hypothesis we must further suppose a high temperature in the comet unless the cyanogen is present ready formed.

I should state that Mr. Lockyer regards the two groups in the photograph, and the groups in the visible spectrum, to be due to the vapour of carbon at different heat-levels ("Proc. Roy. Soc." vol. 30, p. 461).

It is of importance to mention the strong intensity in the photograph of the lines 3883 and 3870, as compared with the continuous spectrum, and the faint bright group beginning at 4230. At this part of the spectrum, therefore, the light emitted by the cometary matter exceeded by many times the reflected solar light. I reserve for the present the theoretical suggestions which arise from the new information which the photographs have given us.

A SAFE LIGHT.

BY A. J. BROWN.[*]

It is safe inasmuch as it absorbs all the rays down to the red, but as yet, gelatino-bromide is sensitive slightly, even to these. Dissolve (there will be some sediment) ½ dr. of aurine in ½ oz. of alcohol, and ½ oz. of water. Soak 2 drs. of clear gelatine—Mr. Henderson's answers well—in 2 oz. of water, and dissolve by gentle heat; stir in the solution of aurine, filter if wanted to look nice, and coat your glass. This will absorb all the violet and blue rays. When dry, coat the other side, or a separate glass if you choose, with a mixture as above, but substituting for the aurine 15 gr. of roseine, which will absorb all but the red and violet bands together; nothing passes but the red. Ammonia destroys roseine, so an acid gelatine should be selected. Plain collodion may be used instead of gelatine if preferred. Mawson and Swan's enamel is good, if this collodion be used; it may be allowed to take up all the colouring matter and it will do so in an hour with frequent shaking; then allow to settle—which takes some time with the aurine—and coat. But the film is much more tender than the gelatine, and liable to peal off with the heat from the lamp. Paper may be coated with a solution of these dyes in equal parts of spirit and water, when it goes right through the paper, applied from only one side; when dry, treat with boiled oil to make more transparent. The paper fades soon, but of course can easily be replaced. These dyes may not be mixed. I send plates coated only on one side, that the Editor may see the effect of each. They are far more thickly coated than need be.

NOTE ON THE WHITE OPALESCENT PRECIPITATE WHICH OFTEN FORMS ON GELATINO-BROMIDE PLATES.

BY MESSRS. S. GEOFFRAY AND V. ROUX.[†]

The principal cause of this defect we believe to be the use of alum in gelatino-bromide emulsions. It is well known that the combination of hyposulphurous acid with alumina is very unstable. When a solution of hyposulphite of soda in excess is mixed with an alumina salt (alum, for instance), the liquid remains clear for some time; but gradually it grows turbid, sulphurous acid is given off, and a precipitate is deposited of alumina mixed with free sulphur. This reaction is more rapid when the solutions are heated. A characteristic of the precipitate is the special condition of the alumina: it is compact, porcellanous, but not gelatinous, and sinks rapidly to the bottom.

---

[*] Read before the Royal Society.

[†] "Phil. Trans.," 1880, p. 669.

[*] Substance of a communication at Thursday Meeting for Photographers.

[†] Communicated to the Photographic Society of France.

It appears that the salts of alumina give up their acid to the alkaline hyposulphite, and that this is then decomposed in the same way as by a free acid. We leave out of consideration the double salts of potassium or of chromium, as they do not affect the question.

The precipitation is the more rapid in proportion as the alumina is present in greater quantity relatively to the degree of saturation of the hyposulphite employed. This is the case when weak solutions of alum are employed in the preparation of the emulsion, or when the plate is plunged, before development, into a 5 per cent. solution of alum, with the object of avoiding blisters and frilling by giving the gelatine sufficient cohesion to withstand the developing and fixing agents afterwards used. Hence a more concentrated solution cannot be employed, as it would destroy entirely the permeability of the film.

The remedy is not far to seek when the defect is observed; it is only necessary to dip the affected plate, after fixing it, into a very dilute solution of hydrochloric acid. We do not recommend nitric or sulphuric acid, because, though the result would be the same, they would have a destructive action on the film. The precipitated alumina is thus dissolved, and a thorough washing completes the operation.

It must, however, be observed that the precipitation of alumina may, under certain circumstances, be advantageous; in fact, it forms a screen, promoting the intensity of the details of the positive, to be taken from the negative on which it is deposited; but it may, in some cases, cause one to reject good negatives, which, when restored by the means above indicated, will give excellent prints.

To sum up: for plates under-exposed the precipitation is an improvement; for plates properly or over-exposed the remedy is an easy one.

Correspondence.

"TO WASH, OR NOT TO WASH?"

Sir,—I see by reference to a recent number of the News, that several experimenters have tried the effect of putting newly-developed gelatino-bromide plates directly into the fixing solution, the intermediate washing being dispensed with; but some difference of opinion seems to exist as to the desirability of this proceeding. I may mention that it has been my practice for over two years to dispense with washing between developing and fixing, and I have found no mischief to result. Quite recently, however, I exposed a large number of plates of different makes, and made comparative experiments in order to instruct myself fully on this point, and the result was that all those negatives which did not receive the intermediate washing were, if anything, clearer and more free from stain than those which had been washed. The saving of time by leaving out the intermediate washing is considerable, but I wish to mention that it is very advisable to employ fresh hypo-solution for each dish full of plates, as it soons becomes coloured by the pyrogallic acid.

Eug. Zuccato.

[Our own experiments support the views of Mr. Zuccato with respect to this matter. The washing ordinarily given after development is insufficient to remove all traces of developer; so no washing at all merely involves the introduction of a little more of the spent or partly spent developer into the fixing solution.—Ed.]

EPSOM SALTS TO PREVENT FRILLING.

Sir,—After reading Mr. Palmer's communication to the Liverpool Amateur Association, respecting the use of a strong solution of sulphate of magnesia as a remedy for frilling, I determined to try for myself. I possess a batch of plates which are suffering from this complaint, and as I was spending a few days at the seaside, on that hot Friday and Saturday, the 15th and 16th inst., I thought it a good opportunity of trying the experiment by taking a few negatives and giving them a dose of Epsom salts previous to development. So I sallied forth and took nine negatives, which I will say nothing about, as far as pictures are concerned, save that they will not be seen in the coming exhibition. Previous to development, I soaked each in a saturated solution of Epsom salts for about three minutes, with the result that I did not get one case of frill. One negative out of the same batch not treated in this way immediately frilled and peeled off the glass.

To my mind, the experiment was a success, and proves to me that in a saturated solution of sulphate of magnesia we have the, as yet, best remedy for frill. It has an advantage over alum, inasmuch as it does not tan the film, which prolongs the development. Bear in mind that the thermometer stood above 80°, and the washing water was quite warm.—I am, yours &c, W. H. Plaister.

PRINTING FROM GELATINE NEGATIVES—ANOTHER COMPLAINT.

Dear Sir,—I find that acting on your hint to float the paper on a strong bath for a short time makes the prints brighter from gelatine negatives.

Your correspondents who complain that they cannot get their orders supplied in reasonable time are quite right. I have been in the habit of dealing with a well-known London firm, sending an order for the goods ordered at the time; About three weeks ago I ordered albumenized paper and mounting boards and since then I have heard nothing whatever. I had to complain of some pyrogallic which I bought there, and which had turned black, although the bottle had never been opened. I am sure if any one would come forward and promise to send off orders twenty-four hours after the receipt of the money, or reference for payment, he would get plenty of customers.—Yours, &c., R. Gordon.

INCREASING SENSITIVENESS OF GELATINO-BROMIDE BY THE AID OF FREE SILVER.

Dear Sir,—This seems to me to be an old friend in a new dress, as reference to your Year-Book for 1878 will show that I pointed it out then so far as its use in excess in the same way as in collodion emulsions. I obtained in that way such extreme rapidity that I was compelled to make the spring shutter, &c., &c., described in your issue of January 10th, 1879, in order to use it at all; and though I have prepared an immense number of trial batches of emulsion, I have never obtained so great sensitiveness by any other means.—Yours truly, Richard Parr.

RE-SITTINGS,

Dear Sir,—Will some of your readers be kind enough to give me advice as to trade usages regarding re-sitting—whether there is a limit to the number of re-sittings, supposing the customer rather hard to please—also the terms upon which those re-sittings are conducted? Thanking you for previous favours,—I remain, faithfully yours, Ignoramus.

DR. VOGEL'S EMULSION.

Dear Sir,—In your valuable journal of July 22, I find a query about my emulsion. In answer, allow me to say that my emulsion has for more than a year been in use on the Continent. It was not introduced till quite recently in England, because it was difficult in the first instance to get the right quality of gelatine, &c., which must be selected for this process more carefully than for any other. For this reason my manufacturer Dr. H. Byk, of Berlin, was at the beginning obliged to work on a small scale, and he was fully occupied by Continental orders.

Now that his arrangements are complete, he purifies all materials he uses, so that he can deliver samples of emulsion far superior in quality, to those tried by yourself a year ago. Dr. Byk, some weeks ago, sent off a supply of the emulsion to England, and if your correspondent will favour the product with a trial, he will find that it is not inferior to gelatine emulsion, while surpassing it in regard to facility of manipulation.—I remain, truly yours,

Dr. H. W. Vogel.

[Dr. Vogel in a private note informs us that Messrs. W. W. Rouch and Co. are the agents of Dr. Byk.—Ed. P.N.]

Proceedings of Societies.

Dundee and East of Scotland Photographic Association.

The annual holiday and excursion under the auspices of the above Society took place on Thursday, 21st inst., when, according to circular, a large number of professionals, amateurs, and lady friends assembled at the Albert Institute, Dundee, at 8.45 a.m., where well-appointed brakes were awaiting them.

Cameras and the usual impedimenta having been stowed away, a start was made on a glorious morning for the town of Kinnaird on the coast of Gowrie, near Inchtree, the route embracing the most beautiful suburb of Dundee; thence along the banks of the Tay west to Invergowrie, Longfergan, past Castle Henithy on the south, and Rossie Priory, the seat of Lord Kinnaird, on the north. Kinnaird Castle, a fine old tower, was reached about 11 a.m.

Cameras were unpacked, and those desirous of competing for the Association's bronze medal, offered for the best picture produced on that occasion, dispersed in search of points of advantage, of which there were many; the grounds and adjacent country affording a choice of scenery extending even to the estuary of the Tay, and beyond to the German Ocean; or pretty little leafy glades with brawling brooks crossed by rustic bridges, with the old tower, its dungeon and antique mysteries standing grim sentinel over all.

For those of the party not devoted to camera work, and desirous of relaxation, amusements of various kinds were provided. A good band invited dancing on the fine lawn, and athletic sports and games beguiled the time until the old bronze bell from the Castle called assembly to dinner, when a party of upwards of one hundred, with appetite keenly whetted, sat down to an excellent repast under a marquee served by Mr. A. C. Lamb, of Lamb's Temperance Hotel, Dundee, who, being himself a good amateur photographer, evidently made the catering a labour of love.

Toasts and speeches there was little time for, but hearty thanks were voted to Sir P. M. Threipland, Bart., for his courtesy as proprietor; to J. C. Cox, Esq., president of the Association, for his zeal in its welfare, and to Mr. Lamb for his good and abundant supply of creature comforts.

Of course the principal feature of the day was the battle of the cameras, which were shooting about in all directions, single and double barrelled; indeed, one enthusiastic amateur, determined not to be outrivalled, on the spot transformed his box of dry plates into a twenty-four barrel mitrailleuse, and fired the whole at one discharge. The shrieks were awful. So firm a *cannonade* could not last; the whole army was becoming demoralized; dropping shots were fired; and pot shots at groups and crowds till time was called for tea. Order, peace, and harmony ruled the remainder of the day, and after pleasant singing of Auld Lang Syne in a great circle on the lawn, the party returned in grand procession, arriving in Dundee at 8·30, all delighted with the outing. Results will be compared, and medal awarded, at special general meeting to be held August 18th.

Thursday Evenings for Photographers.

At the meeting held July 21st, Mr. W. K. Burton in the chair,

Mr. A. J. Brown exhibited a series of very interesting prints from negatives taken with a drop-shutter while the camera was rotating at different velocities from once in two seconds to once in twenty-four seconds (see page 357). The motion of the camera was distinctly visible in the whole series. These prints led to a most interesting discussion on "Balloon Photography."

Mr. Le Fevre thought that the camera should be suspended from the bottom of the car, and not over the side, as heretofore, and, at the request of a gentleman present, he promised at the next ascent (at Lillie Bridge, on the 30th inst.) to make arrangements that the exposure should be made through the bottom of the car.

The Chairman then called upon Mr. Henderson to read a paper entitled, "How to Make Emulsion in Hot Weather (see page 356).

Dr. G. D. Thompson exhibited two negatives of the Thames Embankment, taken by the front combination of a Ross' ¼ plate portable lens, aperture F 18, exposure about a quarter of a second.

Mr. W. M. Ayres exhibited a holder for the dark slide, made of three thicknesses of wood, to hold plates of two different sizes. He also exhibited a dark slide to hold any size plate in any position.

Talk in the Studio.

A Photograph of Lightning Flashes.—Mr. W. W. Mitchell, of Brighton sends us a picture, taken during the storm of the night of July 5th. Two flashes of lightning are depicted; one of these passing in a comparatively straight line between clouds and earth, while the other doubles on itself, and then bifurcates into weaker flashes. Mr. Mitchell writes:—"The photograph of the lightning was taken during the storm on the night of July 5, which I think was one of the finest I ever saw, the lightning being mostly on the under surface of the clouds. Using a camera with a quarter-plate Ross portrait lens, full aperture, I exposed two of Swan's gelatine plates (30 times), on neither of which I got any picture. I then tried two of same maker's ten times, and got a picture on each, one showing the sky lit up, shape of clouds, &c., but no spark; the other was the one I send you. In the negative there is more detail than will print out, being very faint, and out of focus, the getting of which was the great difficulty, the flashes being at varying distances. Should we be favoured with another storm I hope to try again. I cannot remember whether the picture contains one flash or two; I only know the whole western sky was one blaze of light, and there might have been a second spark across the field before I could cap the lens." When no image was obtained it is probable that the flashes were without the range of the camera, the angle included by a portrait lens being small. It would be a matter of considerable interest, in the case of future storms, to cover the whole range of the horizon by a series of cameras arranged radially, and if similar photographic batteries were placed at intervals over a given expanse of country, there can be but little doubt that very valuable records of electrical disturbances might be obtained, as any flash between stations would be depicted from several points of view, and a comparison of the angles subtended to the various instruments would afford the means of accurately localising such flashes.

Examinations in Photography.—The *pass list* of the City and Guilds of London Institute reporting the results of the May Technological Examinations came to hand yesterday, and under the subject "Photography," three candidates passed in the first-class advanced. Of these, Arnold J. Spiller takes the first prize—£3, and silver medal. In the elementary grade several ladies went up for examination, the prizes being awarded as follows:—£2, and silver medal, J. J. Morgan, of Ebbw Vale; £2, and bronze medal, S. J. Loxton, of Newport. The number of candidates passed in all technical subjects amounts in the aggregate to nearly one thousand. The examinations were held this year at no less than one hundred centres, the manufacturing districts of the United Kingdom returning the largest number of candidates.

A Photographic Action.—At the Metropolitan County Court of Clerkenwell, the case of Burrett *v.* Williams was tried, before Mr. Judge Whitbread, in which the plaintiff, a private gentleman residing at Islington, sued the defendant, a photographic artist in Holloway, to recover the sum of £1, being the amount deposited with the defendant under the following circumstances. Mr. Popham, who appeared for the plaintiff, said that his client called on the defendant, to have a carte-de-visite of his late wife enlarged and coloured, and that the price agreed upon was three guineas. At the request of the defendant, his client paid £1 as a deposit, and promised to pay the balance on completion of the portrait. When, however, his client received it, it bore no resemblance to the original, and was so extremely faulty as a work of art, that his client refused to accept it, and demanded a return of the money deposited, which the defendant refusing, the present action was brought for its recovery. The plaintiff, having corroborated his solicitor's opening, produced both the original and copy in Court in support of his case, when it was urged on the part of the defendant that the work was artistically executed, and done in strict accordance with the plaintiff's instructions; and should, therefore, while resisting the plaintiff's claim, put in a counter-claim for three guineas, in consequence of the plaintiff's breach of contract. After evidence had been adduced in support of the defendant's case, showing that every care and skill had been taken in the reproduction and enlargement of the photograph in question, the learned judge said he was of opinion that, from his inspection of the enlargement, the plaintiff was not obliged to accept it, and was entitled to have the deposit returned; and therefore, that being the case, the counter-claim of the defendant be disallowed. Judgment was entered accordingly.

A Lecture on Photography.—On Friday evening last Mr. W. K. Burton discoursed on photography before the members of the Balloon Society and their friends. The Society in question holds its meetings in an upper room of the Westminster Aquarium; but, unfortunately, this room is not sufficiently out of the range of the band to enable a lecturer to speak with comfort. The general principles on which photography depends were first explained to the audience; after which followed a short and lucid history of photographic discovery, a number of very interesting specimens being handed round. Next came more detailed descriptions of some of those processes which are of especial interest at the present time. A platinotype print was very successfully developed on the lecture-table. After the lecture a somewhat discursive conversation was carried on; but the before-mentioned musical accompaniment tended to rather damp the energy of the speakers.

Optical Phenomenon.—Mr. W. J. Stillman writes to *Nature*:—"I enclose copies of photographs from two negatives (as you may see by looking at the points stereoscopically) of the Cylopean gallery at Tiryns, for the sake of calling attention to the optical phenomenon shown in it. The gallery is very dark, the only light entering it by the narrow entrance and crevices between the rocks. At the extreme end of the gallery is an opening to the sky large enough to put one's one's hand through. In the photograph this is shown as a nucleus by a black speck surrounded by bright light, around which appears a dark circle, which again is encircled by a halo as perfectly rendered as one can see that around the moon at times. The dark nucleus is larger in the negative which had the longest exposure (the irregular lights around are only the light falling on the stones from side openings not visible). There was no such phenomenon recognisable to the naked eye. The exposures were 25 and 15 min. with the full opening of the Ross 'portable' lens and a gelatine plate. It is doubtless another example of the 'reversal of the image.'"

Looking Ahead.—Dr. Draper, the eminent American physicist, is engaged in taking photographs of the nebula in Orion, which he regards as an example of worlds coming into existence. The *New York Tribune* says:—"Dr. Draper hopes to place photographs of this nebula in the different museums of Europe, where, in the course of a hundred or a thousand years, as the case may be, a comparison with photographs then taken will show changes that have taken place. This will help to explain the formation of stellar systems from the original luminous vapour, out of which, according to the nebular hypothesis, all the heavenly bodies have been born.—*Telegraph*.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office*, 5, *Castle Street*, *Holborn*, *E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed "Union Bank, Photographic News Co. Account.*"

*** A cheque for two guineas will be given for the best "Reception Room Notes; on Receiving the Sitter and Taking an Order," to be sent in by the 1st August. No name need appear. For rules, see previous numbers of the News.

*** Erratum.—In Mr. Elliott's letter last week "rectilinear" should have been "rectifier," and on the 12th line "fulfilled" ought to have been "filled."

Delta.—1. It is good work, but we cannot appraise it. 2. Certainly. 3. It is not so brilliant as much of the work now-a-days, but that is by no means a fault; it is erring on the safe side, if erring at all.

E. R. complains that he cannot find king Alfred's reply, quoted in last week's News, in his history; obviously, therefore, the information should be added in the margin.

Major Gordon.—The neglect and unbusiness-like proceedings of which you complain are very annoying. Your letter appears in another column.

Otto Pfenniger.—Thanks for your kindness; but as some essential portions of your communication have been rendered illegible during transit through the post, we cannot make use of it. Would you kindly favour us with a repetition?

George Webb.—You would do well to take out a supply of everything for about a twelve-month's use. As regards collodion, you had better not only provide yourself with the usual uniodised preparation, and separate iodizer; but also with a supply of pyroxyline and the necessary solvents. It would certainly be unwise to go unprovided with a stock of gelatine plates, and materials for their manufacture.

Lead.—The negative (collodion) is developed with the usual iron developer, fixed with sodium hyposulphite, and well washed; a final rinse with distilled water being given. It is next immersed in the following solution:—

Lead nitrate	4 parts
Potassium ferricyanide	6 ,,
Distilled water	100 ,,

When the negative has acquired a uniform pale yellow tint, it is well washed, and then immersed in a mixture of one part of ammonium sulphide, and five parts of water. In this liquid the yellow tint changes into an intense black, after which it is merely necessary to rinse the negative.

Nitrate.—1. The addition of any soluble chromate—as for, example the potassium salt—would cause the precipitation of silver chromate. This salt is brick-red, and is soluble in nitric acid. 2. Ordinary lithographic printing-ink is used, but as usually sold it is too thick, and requires the addition of "middle" or "thin" lithographic varnish. 3. Not unless you have considerably over-exposed.

J. Yemburn.—We believe that "Hunt's Researches on Light" contains all that has been published on the subject.

O. Hall.—1. A warm and moderately strong solution of ordinary washing soda will answer your purpose. 2. Not unless a considerable excess is present. 3. The sulphate is usually made use of.

J. M. Linscott.—The mere circumstance of small air-bubbles being present in the glass affords no indication that the lens is bad.

H. J. R.—It appears that you have imperfectly cleaned your plates. In the case of old glass it is well to soak for a few days in a strong solution of bichromate of potassium to which an excess of sulphuric acid has been added.

W. Deveaux.—1. Considerable advantage results from the practice. 2. Provided the salt is not contaminated with copper you may proceed as you propose. 3. It is soluble in about five parts of alcohol at the ordinary temperature.

M. Hill.—Any trace of rust will render the instrument useless; and if the steel is so deeply corroded as to render it impossible to mend matters by friction with crocus and oil, you had better send it to the maker.

J. H. H.—1. It is used in the surgery under the name of "Lunar Caustic"; but the material sold in sticks under this name is often adulterated with potassium nitrate and other compounds. 2. When pure and dry, 170 parts contain 108 parts of the metal.

Richard K. M.—1. It is impossible for us to form the least estimate of the value without knowing all the circumstances. 2. You had better insert an advertisement setting forth your requirements. 3. We imagine that the authorities will hardly permit such a proceeding.

A Wet-Plate Man.—When ether is kept under certain conditions it undergoes the peculiar change you refer to, and is believed by some to then contain ozone. As the quantity you possess is small, it will not be worth while for you to attempt its purification; but you will do well to purchase future supplies from houses who make a special point of selling chemicals for photographic use.

Arthur.—Although no mischief may result from the practice in many cases, it is not well to do as you propose, especially as the saving of time and trouble is trifling.

Samuel Suter.—Thanks for the suggestion.

Theodore Martin.—No consideration whatever can excuse such conduct; it being not only ungentlemanly, but also fraudulent.

Nitrate.—Your bath is probably either alkaline or neutral; you had better, therefore, add two or three drops of nitric acid to each pint, and, if necessary, repeat the dose.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1196.—*August* 5, 1881.

CONTENTS.

PAGE
The Permanence of Silver Pictures ... 361
Variations in the Alkaline Development ... 361
Ammonio-Citrate of Alumina in the Developer ... 363
New-Zealand Exhibition ... 363
The Change of Colour which the Axolotl Undergoes under the Action of Light ... 363
Reviews ... 365
Photography In and Out of the Studio ... 363
At Home—In Princes Street, Edinburgh ... 364
Notes ... 366

PAGE
Topics of the Day—Stops. By Horace Wilmer ... 367
The New Form of Ferrous Citrate Developer, &c. By Capt. Abney, R.E., F.R.S. ... 368
A Drying-Box for Gelatine Plates. By George Willis ... 368
Odd Jobs. By the Author of "Looking Back" ... 368
Collodion *v.* Gelatine. By A. L. Henderson ... 369
Correspondence ... 370
Proceedings of Societies ... 371
Talk in the Studio ... 372
To Correspondents ... 372

THE PERMANENCE OF SILVER PICTURES.

The great liability of silver prints to fade is undoubtedly one of the greatest reproaches against photography at the present time, and the notion that photographs are all doomed to gradual decay and death is so deeply rooted in the public mind, that any reform which may be wrought as regards the matter in question will only restore confidence after many years of proof. This existing state of affairs is especially to be regretted now that the impulse given to photography by the extensive use of the gelatino-bromide process has attracted so much attention to the subject of photography not only from an artistic and industrial point of view, but also from a scientific aspect. How can it be expected that a man of taste, culture, and foresight should spend considerable sums of money on photographs of any objects but those of merely transient interest, when his every-day experience teaches him that many photographs fade within a year, and that the majority will be completely gone ten years hence? It may be said, in answer to the above, that there are permanent photographic processes available, and that several large firms are making continual and honourable efforts to place photography on a better footing with the public by the issue of permanent prints in the shape of Autotypes and Platinotypes. There are, on the other hand, deliberate and systematic swindlers, who profess to issue none but permanent photographs, but supply ordinary silver prints on albumenized paper. The ordinary customer is not in a position to distinguish between the false and the true, and the consequence is, that all falls under one sweeping condemnation.

Most photographers are familiar with the great uncertainty which governs the period at which prints on albumenized paper will fade. In some cases the image begins to lose its more delicate gradation of tone in a month, and in other cases a period of twenty years has left the image nearly as vigorous as at first. The immediate cause of fading appears to be the combination of sulphur with the metallic image; but whence does this sulphur come? The hyposulphite is generally blamed, but there have been well-authenticated cases in which prints imperfectly freed from this salt have lasted for more than fifteen years, while others, with regard to which the greatest care had been taken to remove all traces of the fixing salt, commenced to fade in a few months. Is it not likely that a more probable source of the mischief is the albumen itself? This body appears to contain sulphur as an essential and integral constituent, and, under certain conditions, this may unite with the metallic deposit which forms the photographic image. One condition which favours in a remarkable manner the destruction of the picture is damp, and we remember seeing a remarkable illustration of this some two or three years ago. At an inn close to Weybridge Station there were, and perhaps are at the present time, hanging in the parlour a series of tolerably large silver prints, unfaded except as regards certain narrow bands passing all across, generally one on each print, where the pictures were yellow and in nearly the last stage of fading. An examination proved that in every case the band of fading corresponded to an interval between the backing boards—and the wall was damp. A substance so prone to change as the complex organic body albumen, can hardly be expected to resist the action of damp and air, and during the decompositions due to dampness, it is quite conceivable that the combined sulphur should pass over to the silver, this metal being always more or less prone to unite with sulphur.

We do not find the same tendency towards decay in ordinary collodion negatives, neither in positives on glass, nor ferrotypes, even though these pictures may have been fixed with sodium hyposulphite. It is to be hoped that the same will hold good with regard to enlargements on gelatino-bromide paper, as gelatine does not appear to contain sulphur as an essential constituent, although some samples do contain a mere trace of this element.

If albumenized paper could be banished, and a collodio-chloride paper, or a gelatino-chloride paper, be made to take its place, less would, in all probability, be heard about the fading of paper prints; but it appears to be at any rate advisable to consider whether the albumenized paper process cannot be replaced by a more satisfactory method of printing.

Important researches have recently been made by Dr. Eder with regard to developed pictures on a gelatino-chloride emulsion, and he finds that a very considerable variety of tone—including black, dark grey, various shades of brown, purple red, and light red—may be produced by varying the condition of the chloride in the emulsion, and changing the method of development. Some particulars will be found in the numbers of the News issued during the latter part of April and the beginning of May, but full details may be expected shortly. It is quite possible that Dr. Eder's investigations may lead to as great a revolution in printing as we have recently seen with regard to the production of the negative.

◆

VARIATIONS IN THE ALKALINE DEVELOPMENT.

There has been much discussion lately in photographic circles as to the proportions which are best to use in the alkaline developer, and it has been suggested that those formulæ which we have been in the habit of using might be modified with advantage.

We gave an account a short time ago of the results we got from varying the amount of pyrogallol only. We found that the effect of increasing this reagent is to retard the development, both as regards the time taken to complete the process, and as regards the ultimate amount of detail which can be obtained. We have, since that time, made farther experiments in the same direction, but varying each of the three chemicals used in the developer. We have tried the result of keeping two of these constant whilst we increased the third, and of keeping one constant whilst we increased the other two in like proportion.

We have, in making these experiments, used the actinometer, and have checked the results by taking negatives in the camera. Our reason for using both methods is, that we consider that sensitometer exposures are the best criterion of the power of a developer to bring out detail, while an exposure in the camera is the best test of density. The general results which we have obtained are as follows:—

The effect of increasing the pyrogallol is, as we have seen, to retard development, both as regards the time taken, and as regards the amount of detail obtained, whilst the density is increased.

The result of increasing ammonia is to accelerate development greatly as regards time taken, and to a certain extent; but not, we believe, so much as is generally supposed with regard to the ultimate amount of detail which can be brought out. Density is increased in this case, as in the last.

Increase of bromide results in considerable retarding of the time taken for the image to appear and for development to be complete, but very little, if at all, in the amount of detail which can be had if development be continued long enough. In this case, as in the other two, increase of the reagent results in an increased density.

We have found the result of varying two of the components of the developer, whilst the third is kept constant, to be as follows:—If pyrogallol be kept constant, and ammonia and bromide be increased in like proportion, the effect is an accelerating one, both as regards time taken and ultimate detail, whilst density is much increased. If ammonia be kept constant and bromide and pyrogallol be increased, the effect is a decidedly retarding one, both as regards time taken for development to be complete, and ultimate amount of detail. If bromide be kept constant, and pyrogallol and ammonia be increased, the result is a slight reduction in the time taken for development, but apparently little in the ultimate detail.

As an increase in the amount of any one of the three reagents employed has the effect of increasing density, it is natural to assume that the increase of the whole three—or, in other words, the increase in the strength of the developer—will have this result to a marked extent, and, as a matter of fact, we know that diluting the developer has the effect of greatly increasing the time required to attain density, whilst concentrating it has the opposite effect. We have here a ready means of correcting the tendency that some plates have to give too thin an image. We have been able to find little difference in the amount of detail obtainable by a strong or a weak developer, if sufficient time be given with the latter.

The result of these experiments, which we consider most useful, is that which shows that a considerable increase in the bromide beyond that generally used may be made without necessitating a longer exposure in the camera. We consider this a matter of no small importance, as a developer containing a large amount of bromide has several advantages over one containing a small amount. The development is from the beginning well under control, and can be watched easily, the shadows are kept clearer, and the general quality of the negative is thus improved, whilst there is a considerably greater latitude permissible in the exposure.

It will also be seen that in the case of suspected or ascertained over-exposure, it is far best to retard by the increase of both bromide and pyrogallol than by bromide alone.

Again, we would point out that the reagent which is most useful in increasing density is ammonia, not, as is generally supposed—pyrogallol. We are talking now of a corrective, not for want of density due to over-exposure, but to that thinness peculiar to some plates, or resulting from flatness of the subject. Of course, with a developer feebly restrained, the addition of much ammonia above the normal amount will result in fog; but if a well-restrained developer be used, this need not be feared.

The developer which we have found most effectual in bringing up detail in under-exposed plates is one in which there is a very large quantity of bromide, two or three grains to the ounce, and in which the ammonia is increased to the largest quantity which the plate will bear without fogging, and the pyrogallol decreased to about half a grain to the ounce. The amount of ammonia which may be added varies greatly with different makes of plates, and even with the same make at different times. We have found one make of plates which, with three grains of bromide to the ounce of developer, will stand the addition of ammonia till the solution is very nearly a ten per cent. one.

We have tried the result of covering the plate with one or two of the reagents before the others were added. The only case in which we have found any benefit to arise is that in which we added the ammonia in solution, and allowed it stand over the plate for about a minute before we added the pyrogallol and the bromide. In this case we found we could shorten the exposure considerably—with some plates even to one-half or one-third of what was required with a normal developer.

We can recommend as a good developer one in which the bromide is increased from one to two grains to the ounce. With this amount of bromide the ammonia may with advantage be increased from the usual two minims to the ounce to three, and the pyrogallol may be decreased. The amount of pyrogallol required varies considerably with different plates; but with a plate which does not tend to give a thin image, it will be found that with the above quantities of bromide and ammonia, one-half to one grain of pyrogallol to the ounce is ample for portraiture, and three-quarters of a grain to two grains for landscape.

We may mention that this developer is very similar to one of the oldest formulæ published with commercial plates—namely, that of Swan.

How the stock solutions are mixed we consider of little importance; but we would point out that, to give the operator the full benefit of all the variations which can be made to suit different exposures, different subjects, and different plates, it is necessary that each of the three reagents should be capable of variations independently of either of the others, and for this purpose it is necessary that a separate solution of each one should be made up. No better plan can be adopted than that of keeping an aqueous solution of each chemical containing each the same fixed per centage. To keep the pyrogallol clear we have found nothing better than citric acid, as recommended by Mr. Warnerke and Mr. A. Cowan. We find one drachm of citric acid to the ounce of pyrogallol sufficient; but it must be borne in mind that it is necessary to add the citric acid to the water before the latter is allowed to come in contact with the pyrogallol, otherwise the solution will darken before the citric acid is added.

Let us here enter a protest against the manner in which developers are generally stated. The usual method is to enumerate two or three stock solutions, and then to give the manner of mixing them with the final water, the whole method of stating being such, that to find how many grains or grammes of each constituent goes to the ounce of developer, requires a more or less complicated calculation to be made. Why should not developers always be stated as so many grains to the ounce of each of the principal reagents, and a little be left to the discretion of the operator as to how he chooses to mix these reagents, so as to arrive at the developer recommended?

AMMONIO-CITRATE OF ALUMINA IN THE DEVELOPER.

The interesting and important communication with which Mr. Spiller has favoured us this week comes at a seasonable time as offering an infallible remedy against frilling. The use of alum for this purpose has often been suggested and successfully applied, but in attempting to use this salt with the pyro-developer, or even washing the plate with it immediately after development, one meets with a practical difficulty arising from the fact that common alum is precipitated by ammonia, and, this got over, there is further trouble when we proceed to immerse the film (now impregnated with an acid salt) in the neutral bath of hyposulphite for the purpose of fixing.

Mr. Spiller proposes to overcome these difficulties by employing an alkaline solution of alumina—the ammonio-citrate—which is easily prepared, and acts like common alum in indurating the film. Our correspondent hints at the possibility of using this salt as a restrainer, and if his anticipations are realised by the further course of experiments which he proposes to make, the process of developing a gelatine film becomes simplified to the extent of using the above-mentioned double citrate in admixture with pure pyrogallic acid. Mr. Spiller informs us that he uses about one drachm of the citrate solution for every three grains of pyrogallic acid, and that the mixture, being then already alkaline, needs no further addition of ammonia. The stock solution, of which the formula is given, is said to keep well for any moderate length of time. and if the pyrogallic be also dissolved with one-eighth proportion of citric acid, this also may be preserved fairly well; but it must be remembered that using more acid in this way demands afterwards the employment of more ammonia in the developer, and this may go in either alone, or mixed as usual with a bromide.

A further suggestion which our correspondent makes in a second letter to us relates to the possible use of a chrome alum solution treated in the same way. As this salt has already done good service in hardening gelatine films, it becomes important to know whether, in the form of a double citrate, advantage could be taken of adding it to the developer. In this case the solution would be coloured, and might have a tendency to stain the film. The whole subject is, however, still under investigation, and we hope shortly to have the pleasure of laying before our readers Mr. Spiller's further results in this interesting field of inquiry.

NEW-ZEALAND EXHIBITION.

A copy of the Dunedin *Morning Herald* informs us that the Industrial Exhibition was opened here with great *éclat*. Photography is included in the Exhibition, and in the *Herald* appears a brief account of this section. Mr. Nelson Cherrill, a name as well known with us as in New Zealand, does not appear, so we suppose the well-known Christchurch photographer is not among the exhibitors. Our Dunedin contemporary says:

"Photography occupies a large space in the art department; not only have the numerous photographers of Dunedin sent specimens of their skill, but contributions have also come from the Northern cities. Messrs. Clifford and Morris maintain their high reputation for careful work; but some of the other firms exhibiting run them very close. Mr. W. R. Frost, of George Street, sends some admirable photographs, one of which, the head of an old man, is for quality of tone and finish unexcelled, if indeed it is equalled, by anything to be found here. The camera pictures of New Zealand scenery shown by Messrs. Burton deserve the highest praise, and Messrs. Coxhead and Le Sueur's contributions in the same line are worthy of commendation. Mr. J. M'Gregor sends some specimens of 'permanent' photography of considerable merit; but they are rather unfortunately placed in regard to light, and are consequently not seen to advantage. Judging from the photographs sent from Nelson and Wellington, we can safely say that the Dunedin firms are more than able to hold their own in this branch of art, and have nothing to fear from competitors in other parts of the Colony."

THE CHANGE OF COLOUR WHICH THE AXOLOTL UNDERGOES UNDER THE ACTION OF LIGHT.

The extraordinary changes of colour caused by the action of coloured rays of light on the skin of the axolotl, a species of aquatic lizard which inhabits the Mexican lakes, have recently been investigated by Herr Semper, of Wurzburgh. He found that if this animal be allowed to grow in complete darkness, its colour is no longer white, but perfectly dark. If exposed to red and orange light, the colour fades away, and under the action of white light alone, its colour is white.

This change of colour is due, according to Parker's theory, to the formation of a peculiar greenish yellow pigment, the increase of the white corresponding with a decrease of the dark coloured matter.

If the axolotl be laid in a dish covered with a sheet of white paper, and exposed to daylight, there is very little increase in the formation of the dark pigment, as compared with the result of a similar exposure without the paper covering.

Semper found that the chemical rays of light play no part in the formation of this pigment. The real cause of this peculiar fading of colour under the action of white light, and its formation in the absence of the same, remains, in spite of Semper's investigations, still a mystery.

Reviews.

All about Derby and the Neighbourhood. By Edward Bradbury and Richard Keene. (*Derby: R. Keene.*)

A Week's Holiday in the Forest of Dean. (*Gloucester: John Bellows.*)

We like this shilling handbook about Derby far better than the half-crown manual issued by Stanford, of Charing Cross. With the latter we have walked on two occasions through Derbyshire, and we never before realised how misleading a bad guide-book could be. The volume of Messrs. Bradbury and Keene is less pretentious, and, being subdivided into paragraphs, or notes, describes the various attractions, without proposing to be guide, philosopher, and friend. A platinotype showing Derby from Exeter Bridge forms the frontispiece, and the interesting little volume is provided with numerous cuts.

We are also glad to call our readers' attention to a handbook of the Forest of Dean which is sent to us. The descriptions are clearly written, and due prominence is given to the principal attractions of this beautiful district. The woodcuts, some of which are from photographs, are scarcely so satisfactory as the letterpress.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Photographing Guiteau—Cheap Copyists—Colour Photographs—Photographing Comets.

Photographing Guiteau.—It is to be hoped the criminals who are photographed in our gaols are not as particular as Guiteau, the would-be assassin of President Garfield. When Mr. C. M. Bell, a photographer of Washington, waited upon the prisoner, he at first objected to have his portrait taken, on the ground that he desired to have it taken in first-class style by the best photographer in the country. However, on being assured that Mr. Bell *was* one of the best, he consented; and the camera having been set up in the rotunda of the gaol, Guiteau was sent for. He evidently was impressed with the gravity of the occasion. Walking up to the photographer, he said: "I am the person who wants his photograph. Now, I want you to do me full justice. See that you get a correct expression of my eyes." Having given this caution, he buttoned up his coat, brushed back his hair with his hands, and arranged his necktie, "just as any other person would do," remarks the *Chicago Tribune*, "who was preparing for a sitting," which, after all, was less extraordinary than if he had endeavoured to stand on his head or one leg, or had tried to assume any other position equally abnormal and eccentric. Guiteau's further proceedings did not differ from those of any other person, and so far his conduct was entirely that of a person in full possession of all his faculties, especially of the faculty, in a phrenological sense, of self-esteem. We are told he took a position standing by a chair, with his head thrown back, and, assuming the air of a man of great importance, inquired if it was not an excellent position. The photographer told him he was standing rather stiff, and that he should place himself in a perfectly easy position. Guiteau then remarked that he supposed the photographer knew his business, and that he could arrange him in such a way as to suit himself. What he wanted was a picture, and he again had some anxiety as to the photographer obtaining a correct expression of his eyes. Eight different styles of pictures were taken, showing him standing, with his hat on and off, and sitting, with full and side face. After each sitting, when the photographer would take out the slide to be examined, Guiteau would inquire how it looked—if the eyes were all right; and, in fact, behaved himself as a properly-regulated sitter would do. It must be confessed the whole operation savours so much of ordinary studio life, that it scarcely bears out the expectations which one would form from the startling announcement of "Taking a Fiend's Face," with which the *Tribune* heads its description.

Cheap Copyists.—The subject of "portrait enlargements from other people's negatives is not the only vexed question of the time. Some time ago, when enterprising photographers were doing a roaring trade in the copying of cartes at a very low price, it was not an uncommon thing for sitters afflicted with meanness to go to a good photographer, have *one* or the smallest number of cartes they could be supplied with, and then send the picture to be copied by the cheap man. In this case there was a risk of a double injustice. If the copy was a good one, then the copyist took the credit of the work; if it was a bad one, then the blame was thrown upon the original photographer. It is obvious that no arrangement between the photographers is possible, since it is very certain that the man who made the negative, and who was responsible for all that was artistic in the picture, would never consent to anything of the kind; but if he was so lost to self-respect as to make an arrangement, the difficulty comes in that the sitter in most cases carefully conceals the fact that the photograph is taken for the purpose of being copied. Of course the only remedy is to refuse to take any quantity less than a dozen, but the remedy is more easily suggested than practically applied in these hard days of competition. Here, as in a good many other photographic problems never yet settled, the question of copyright comes in. Has the photographer any legal interest in the copyright of prints made from a negative of which he is the undoubted possessor? If he has, it is evident the occupation of the copyist would be practically at an end.

Colour Photographs.—As on an average a new method of producing photographs in colour is announced at least once in three months, it should take no one by surprise that the familiar title appears once more. The very latest method is the invention of MM. Ch. Cros and J. Carpentin, and its description is contained in a communication to the French Academy of Science. The process consists in taking three separate photographs of the red, yellow, and blue tints, and then combining them. Three negatives of the object are first taken, one through a screen of orange liquid, one through a screen of green liquid, and one through a screen of violet liquid. The varying opacities and transparencies of these negatives indicate the relative quantities of red, yellow, and blue tints in the object. The proofs are taken on plates of glass coated with coagulated albumen which has imbibed bichromate of ammonia. A transparent negative, or first photograph, is applied to one of these, and exposed for some minutes to a diffused light, so that the transparencies and opacities of the negative shall imprint themselves on the sensitive albumen. The proof plate is then plunged into a colouring bath, and in the parts protected by the opacities of the negative the colouring matter spreads and fixes itself. By repeating this operation with the three different negatives, the three colours are combined on one glass plate, and it is said a fair imitation of the original object is the result. It should be mentioned that for the image obtained through the green screen the colouring bath is red; for that through the orange screen, blue; and for that through the violet screen, yellow. The same screens and pigments serve to reproduce all sorts of polychromes. The screens hitherto used are glass vessels filled with solutions of chloride of cobalt, chromate of potash, and sulphate of copper. When the electric light is used, the screen is put before the lamp, so that the object will be illuminated by a monochromatic light, and photographed in the ordinary way.

Photographing Comets.—American reporters are so imaginative that it is hard to distinguish between invention and fact. No sooner was comet B announced than a reporter went off post haste and interviewed Professor Draper on the subject. According to the published report of the interview, the Professor appears in a bombastic aspect, which we fancy does not really represent him properly. The reporter asks him whether the comet is an old or a new one, whereupon the Professor is made to reply:—"That is hard to say as yet. I consider it of little consequence, however, whether the comet is a new one or old one. Its interest to me is two-fold—first, the possibility that it may be photographed; and secondly, the facilities which it affords for spectrum analysis. No comet has ever been photographed, but I have the apparatus ready for the attempt to-night. I have already succeeded in photographing the nebula in Orion, which no one ever did before, nor indeed after me, and to-night I hope to get the first impressson of a comet. I like to get a dig at those fellows across the water, you see. The tail of this comet is very voluminous, thus increasing the facilities for obtaining spectrum analysis." What does Dr. Huggins think of the "dig" supposed to be administered by Professor Draper?

At Home.

IN PRINCES STREET, EDINBURGH,

In the finest street of the finest city of the United Kingdom—we had almost written of the world—are to be found, as might be expected, several studios of note. Princes Street, on a clear summer's morning, affords a spectacle indeed. On one side a magnificent row of handsome stone built houses and attractive shops; on the other, the old castle on a pedestal of grey rock rising aloft from a grass-green plateau. Calton Hill, with its picturesque columns, adds further to the scene, and the towering heights of Arthur's Seat look down upon the town from afar. Walking the broad even thoroughfare, we pass the classic-built Museum and the more florid pile of white stone erected to the memory of Sir Walter Scott, which alternate the green gardens that Princes Street looks upon. Some portion of Piccadilly—that which borders upon the Green Park—may perhaps be likened to this fair street of Princes, which has not its peer in the whole universe.

Mr. Moffat's studio, a name almost as well known south of the Tweed as in Edinburgh, is situated opposite the castle. The handsome reception room on the first floor, containing, as it does, much excellent work, strikes the visitor at once with admiration and respect, and we may say, without further ado, that Mr. Moffat's establishment is one of those which adduce proof of a solid, high-class undertaking at the first glance. The gallery and the way it is arranged forthwith carry conviction. And yet Mr. Moffat is far from being old-fashioned in his notions. We have rarely seen so many novelties exhibited in connection with sound standard work. The Promenade, the Malvern, the Mammoth, and several other less known pictures, are here for the approval of visitors. Mr. Moffat adopts a simple and effective plan of showing portraits of smaller dimensions. Instead of placing a small slab of glass over one or other of the pictures, he uses a long strip of plate-glass, which is thus made to cover a whole row, and is at the same time almost invisible. The fine portrait of Mr. Fox Talbot, which we had the pleasure of presenting to our readers a few months ago, was taken by Mr. Moffat, and that gentleman assisted Mr. Talbot during some of the latter's more recent experiments connected with photo-engraving. A portrait of the late Prince Consort, Mr. Moffat told us, he entrusted to Mr. Fox Talbot for the purpose of etching upon metal; but, as many of our readers know, Fox Talbot was more successful in producing photo-mechanical prints of architectural subjects than of portraits.

Mr. Moffat shows us his studio. In one respect it resembles that of Mr. Valentine Blanchard: it is a dark studio, not a light one. It is lofty, spacious, and very wide. The plaster walls are painted dark brown, the floor is evenly covered with carpet of slate colour. There is a low skirting-board on the light side, and the glass is covered with tissue paper up to about four feet. What remains of the window is of clear glass, which, however, is largely screened off when in use, the greater portion of the illumination being a diagonal toplight. Where the cameras are placed, the studio is very sombre, and they may, if necessary, be receded down a passage so dark, that the use of a focussing cloth is not needed. There is, in short, a subdued neutral tint pervading the whole studio, which must be exceedingly soothing to the sitter; only one background, and that a plain one, is to be seen.

Above this is another and lighter studio, employed for the most part for children, and at times when the weather is exceptionally dull. Mr. Moffat complains sadly of being robbed of "ancient lights" by new buildings, for in Edinburgh, of all towns in the world, architects think nothing of adding two or three stories to a neighbouring tenement.

Gelatine is in favour at Mr. Moffat's studio, pyrogallic development being used in connection with the dry plates. In the developing room a row of gas jets are employed, screened by a double thickness of ruby paper. The mechanical staining of the film by the pyrogallic acid, as it becomes oxidised, is, it cannot be denied, a drawback of some gravity, for although the brown tint is now removed by after treatment, this operation cannot always be undertaken with old retouched negatives, and sometimes involves delay which cannot well be afforded. But it is not so much in ordinary printing as in enlarging that the brown tint is so objectionable. Mr. Moffat varnishes his gelatine negatives before he retouches; he prefers this to rubbing the gelatine with a "medium" or with turpentine, for, as he does it, the work is more akin to the treatment of a wet plate.

Mr. Moffat's stock of negatives is very large; he has about 100,000 quarter-plates alone, the result of work undertaken many years ago. But they have all kept well, simply racked, and print as bright as on the day they were taken. Shall we be able to say the same of the mercury intensified gelatine negatives of the present day?

The studio of Messrs. Ross and Pringle is not far removed from that of Mr. Moffat. The former is also an establishment of long standing, and is proud of the inscription "Photographers to the Queen, 1849." The studio of Messrs. Ross and Pringle contains, indeed, much that is historical in connection with photography. Here is a wet plate taken eighteen years ago, that would puzzle even the clever drop-shutters of to-day. It is the picture of a boy in his shirt sleeves, in the act of jumping over a box. It is but a small picture, it is true, and the boy's legs might be more sharply defined; but it is nevertheless a feat in photography which ranks with that of Mr. Muybridge, of whose galloping horses we have heard so much lately.

Here is another photograph to look at, worthy of the camera of a Rejlander or Robinson. It is called "Sunshine." Two girls sit by the open window, with the sun's rays upon them; one is mischievously teasing a parrot with a feather, and the other is all smiles at the behaviour of the bird. There is, indeed, sunshine in the laughter of the girls. "The picture has been engraved and published several times," says Mr. Pringle, and we are not surprised to hear it. Another set of pictures, in which a boat and real water are introduced, deserves mention. A handsome lassie in the act of rowing, and looking half round the while, is a very successful portrait.

Here is a group at Balcarres Castle. There are no names under the portraits, but it is not difficult to recognise Sir Coutts Lindsay, and Mr. Arthur Sullivan, the composer. They are a party invited to meet Prince Leopold—we beg pardon, the Duke of Albany—who stands in the centre of the group. Some carbons on opal which are exhibited in the reception room of Messrs. Ross and Pringle are also deserving of mention. Chrome gelatine is employed, as usual, as a substratum for these carbon impressions, and fine pumice powder is employed for rubbing the carbon surface afterwards, if it will not otherwise take the brush.

The fish-wife costume, with its striped petticoat, seems to be affected a good deal by Edinburgh ladies when they have their portraits taken, in the same way as their lords frequently choose the kilt as a suitable costume in which to be photographed; thus it comes about that stern-looking Highlanders and Newhaven fisherwomen make up between them a strong *clientele*. This is decidedly a mistake, for many of the portraits we see would represent pleasant people enough if they were only clad in their every-day clothes. A smug face and trim beard still remind one of the counting-house, albeit the person may be arrayed as a highland chief; and even if a lady lets down her back-hair as a fish-wife (it usually represents the art of the Paris *coiffeur*) the hanging tresses do not fall naturally, but show as plain as plain can be that they have been but dropped for the nonce.

The studio is roomy and well appointed, but need not be specially described. Messrs. Ross and Pringle employ both the dry and wet process, the latter still being in favour. Mr. Pringle speaks highly of the Burton or horizontal bath, called so, we presume, after the clever gentleman who has the direction of the enlarging laboratory at the Autotype Company. Mr. Pringle believes it to be the most economical and handy form of sensitizing bath, and he has not a single vertical one in his establishment. The floor of the vessel should, however, always be made of corrugated glass, as this prevents the plate cleaving to the bottom of the bath, and permits of its easy removal.

Princes Street has other studios of the first-class—that of Mr. Howie, for example—but for the present, at any rate, we must defer a description of them.

The "By-the-Bye" next week will be "A Photographic National Gallery"; the following "At Home" will be "Messrs. Annan Brothers, in Sauchiehall Street, Glasgow."

Notes.

A summer wrinkle for wet collodion workers in the studio. In very hot weather, when thin collodion films are apt to yield flat unserviceable pictures, German photographers often refrain to expose the thinnest end of their triple Carte plates, only taking two portraits upon each.

Apropos of "stops." A photographer brought to close quarters in taking a building, spoke very irreverently from under the dark cloth of his long focus lens: "It's no use, George," he said to his assistant; "this makes the building far too large." "Too large?" responded George; and then he added, after a moment's thought: "I'll tell you what—put in a smaller stop." Verily, we want Mr. Wilmer to tell us something about "stops."

The second Congress of the Photographers' Association of America takes place on the 16th inst., at New York. Among others, Professor Morton will lecture on Light and Optics, and Mr. Thomas Gaffield on Glass.

Dr. Eder communicates a simple method of transforming gelatino-bromide negatives into gelatino-chloride pictures, which is very similar to M. Zuccato's method already published in our columns. The developed and fixed image is put into a solution of—

Bichromate of potash	1 part
Hydrochloric acid	3 parts
Water	100 to 150 parts

when the change is quickly brought about, the chloride of silver film that results being much more easily intensified or weakened than the original bromide. The colour of a chloride film, as has already been pointed out, may also be made to assume various tints.

Professor Langley, the director of the Allegheny Observatory, lays claim to a discovery which, if true, will form an entirely new starting point for researches in solar physics. Professor Langley tells us that the sun is not really white, nor yellow, nor red, as we see it at different times of day, but that sunlight is blue. It is our atmosphere that gives it a false colour. In a word, Professor Langley would have us believe that the sun ought to appear as blue as the electric spark, and if we looked at the latter through a yellow atmosphere, it would not be unlike the sunshine we see.

Of course, if Professor Langley is right, not only will he upset physical theories in general, but photographic theories in particular; meanwhile, it is some consolation to know that his discovery will not interfere with our daily practice. Professor Langley proposes to undertake some experiments at different altitudes, so as to be as free as he can from the lower strata of atmosphere, at any rate; and with this view he intends to establish two special observatories, the one at a station 3,000 feet high, and the other 14,000 feet above the level of the sea.

An association of photographers' assistants is being formed in Berlin.

Captain Elsdale, R.E., writes from Gibraltar that his photo-balloon experiments are "altogether for a special purpose, and owing to deficiency of apparatus are undertaken under considerable difficulty." We hope to publish any novel results that may be arrived at in connection with this renewed attempt to derive military advantage from the balloon and the camera.

Several attempts were made to depict the yacht race this week at Cowes, but the distance of the camera gives very disappointing results. The Spithead Fort, a little round beauty spot in the middle of the fair waters of the Solent, stands out as a tempting pedestal for the camera when any maritime display occurs in the vicinity, but this point of vantage is forbidden ground, and friends and foes are alike sternly warned off. How sternly, we will narrate.

Mr. Jabez Hughes received a sudden command from Her Majesty to take a photograph of the ironclads in line of battle, when two years ago they were anchored in close vicinity to the fort. He chartered a boat, embarked his apparatus, and took what assistance was necessary. He landed at the fort, and was at once challenged by the sentry, who sent for his officer. "What authority have you?" asked the latter. Mr. Hughes produced the best of all authorities, the highest in the land—a telegram from the Queen. The officer shook his head; he could only act on one order—the written instruction of his commanding officer.

There was nothing for it but to give up. At first Mr. Hughes conceived the idea of going to the port admiral's office at Portsmouth; but, fortunately, he desisted. The admiral would have referred him to the major-general commanding, and the latter must have communicated with the authorities in London before granting the desired permission. Mr. Hughes wisely went home instead.

The plucky little ship, *Willem arents*, in which Mr. W. J. A. Grant is taking his fourth photographic trip to the Polar Regions, has been heard of at Vardö. It made an unsuccessful attempt to reach Spitzbergen, which was found surrounded by a broad belt of ice. Another struggle northward through the frozen seas would be made in a month's time, and then the ship and her little crew of ten persons, all told, would face about for home again.

Major Waterhouse, the Deputy-Surveyor of Ordnance at Calcutta, who is now enjoying a twelvemonth's leave of absence in this country, returns to India in November. His photo-engraving process, in which waxed sand particles are sprinkled over a wet gelatine relief, and removed when the film is dry, leaving pit-marks of a deeper or shallower character according to the depth of the shadows in the gelatine image, is making satisfactory progress, and will certainly become a practical method before long.

"I used to take a lot of trouble to make a sketch for the 'Academy Notes,' a well-known painter told us, "until I found out how most of them went to work. They simply get a photograph taken of their painting of the size of a cabinet, or even smaller, and then trace upon transparent paper the salient lines of the photograph. In a quarter-of-an-hour you have got a correct little picture, in proper proportion, and with all the idea of the original about it."

The Government Photographic Establishment at Lisbon, in connection with the State Paper Office, which was fitted up some five years ago upon a most perfect scale, with all the most recent improvements in photo-mechanical printing, has been abandoned and permitted to fall into decay. Some £20,000 was spent in making it the most perfect establishment of its kind in Europe, yet a gentleman who visited it last month reports the buildings almost deserted, a man and boy engaged in working a collotype press being the only remains of its former activity.

The cause of failure is set down to political and trade jealousy. The establishment appears to have been founded by a scientific officer of a former administration, and the party being no longer in power, the project is neglected. But the Portuguese engravers are also responsible for the downfall of the establishment. They imagined photography was going to supersede engraving, and so did their best to suppress the camera and its adjuncts. To attempt to stay the progress of science by such means is obviously as idle as it is foolish.

Topics of the Day.

STOPS.

BY HORACE WILMER.

Every photographer is aware of the simple fact that the duration of any exposure depends on the size of the stop employed in the lens, and I suppose there are few now-a-days who are not also aware of the unfriendly relations which exist between the area of a circle and its diameter, and the necessity, in consequence, of giving with a certain stop twice as much exposure as it ought in common fairness to be allowed. To the peripatetic photographer, who stations himself under a spreading tree on any of the highways in the vicinity of the metropolis, and plies his calling with a small box of passe-partouts and a bottle of black varnish, the ignorance of such subjects is as blissful as the enjoyment of the small clay pipe with which he whiles away a slack half-hour; and if he does use a stop it will probably be one in which the area does not take such a mean advantage of the diameter as when amateurs or scientific photographers are at work. However, now that gelatine has appeared like a meteor on the scene, and is hurrying us forward in a manner many of us don't care about, it is as well to put everything in order and reduce the subject of exposures and focal apertures to their lowest denomination. Slight errors in exposure were of less importance during the slow days of collodion than they are in the days of gelatine, where a very trivial mistake makes the difference between a good and a bad negative, and any method which will enable photographers to decide at once the varying exposures for varying sizes of stops is likely to be welcome.

The stops as issued at present by manufacturers of lenses do not, as a rule, represent simple proportionate exposures, but vary according to some secret and mysterious law which Stuart Mill would probably describe as empirical. The most simple series of stops which can be used are those the diameters of which proceed in such a ratio that the exposure for each stop is double that required for the preceding one. The diameters for such a series can be easily calculated by multiplying each diameter by $\sqrt{2}$ (that is, by the figure 1·41); but as this is a tedious operation, and requires that the results so found should be converted afterwards into what Mr. Gladstone calls measurable distances, I venture to offer a method which is mathematically correct, and unmathematically simple.

Euclid, who I am sure must have studied photography deeply, proved that the square described on the hypothenuse of a right-angled triangle is equal to the sum of those described on the other two sides, and on this simple but valuable fact is based the whole of my suggestion.

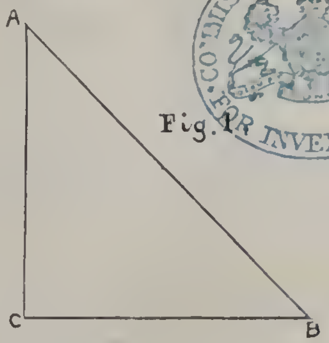


Fig. 1.

In the triangle ABC, the square on AB is equal to the sum of the squares on AC and CB. Now, if AC be equal to CB, the square on AB will be double of the square on either AC or CB, and consequently if the diameter of a certain stop be equal to AC or CB, a stop whose diameter is equal to AB will have double the area, and will therefore require only half the exposure. I can see the Editor raise his eyes in pious horror to think that this is all, but at the risk of being ranked in the category of those who have "taken him in," I will proceed to describe the best way of constructing such a scale.

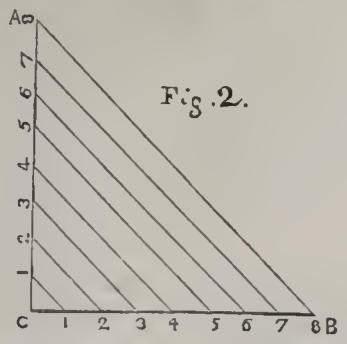


Fig. 2.

Take a piece of card and lay off two lines at right angles to each other, and from their point of intersection, C, mark off equal divisions on the lines CA and CB. Number the divisions horizontally and vertically, making the zero of the scale at C, and join the corresponding points so obtained by diagonal lines. The latter proceeding is not absolutely necessary, but assists in determining the length of any diagonal which falls between any pair of consecutive points. To use the scale, any stop which may be accepted as the starting smallest stop is measured on the horizontal or vertical lines, and the corresponding diagonal line will be the diameter of the next sized stop. This length, when found, is measured along the horizontal line again, and a new diagonal found for the next stop in series. If the largest stop is chosen to start with, the proceeding is reversed, and the line of diagonals used to determine the point on the horizontal line giving the next smaller line. Perhaps the simplest method is to use a pair of identical scales, as in fig. 3. Assume the smallest stop to measure 2 on the horizontal, the next stop will be 2 on the diagonal. Now lay the second scale on the line so found, note the dimension on the CB, and the diagonal corresponding will be the 3rd stop required. Use No. 1 scale on No. 2 for the next stop,

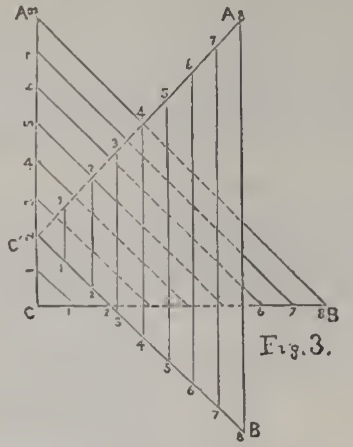


Fig. 3.

and so on for the whole series. I beg to hand my friend Euclid the credit of this in return for many valuable suggestions.

The "Topic" next week will be "Treatment of Gelatine Negatives," by George Croughton.

* * *

A NEW FORM OF THE FERROUS CITRATE DEVELOPER, ETC.

BY CAPT. ABNEY, R.E., F.R.S.

Dr. Eder recommends the use of ferrous citrate dissolved in ammonia citrate as a developer for gelatino-chloride of silver plates. It is a very feeble developer, however, and takes some time to act. As a matter of fact, I find that hydrokinone with a tolerable dose of carbonate of ammonia is more effectual, and this developer certainly gives most beautiful pictures. In the camera I find that the chloride is very considerably quicker than a wet plate, and I believe will be found to approach more nearly the bromide than is usually thought. When taking transparencies by gas light of course it compares very unfavourably with the latter salt, since it is extremely sensitive only to those rays which are almost absent in that source of illumination. A stronger developer for it may be prepared by the following plan.

Make a saturated solution of neutral potassium citrate in water, and in this solution boil the yellow ferrous oxalate till a residue is left. The solution will be a very dark olive brown colour, due to the ferrous citrate held in solution by (probably) both potassium citrate and potassium oxalate. This developer can be used with chloride plates by using a fair dose of some soluble chloride. It can also be used to develop a bromide plate. The potassium citrate is extremely soluble in water, and is but a trifle dearer than potassium oxalate. I prefer this to the mixture of the ferrous citrate and oxalate developers which I mentioned, since there is no ferrous deposit caused by it. The more I see of the chloride plates, the more I like them, and Dr. Eder and his colleague have done good service in bringing the matter forward in the thorough manner in which they have. As far as my experiments go, I am induced to think that the process will have more than a theoretical value.

* * *

A DRYING-BOX FOR GELATINE PLATES.

BY GEORGE WILLIS.

I have seen many arrangements for drying gelatine plates. Most of them have been boxes, with a small jet of gas or other artificial heat. I have tried many of these methods, and some of them are good; but in all, where artificial heat is applied, the plates dry unevenly, and, to my mind, one of the causes of frilling is due to this heating. On the other hand, I have found a box as here described to be very good for drying gelatine plates. They dry moderately quick and perfectly even, and are less liable to frill.

It is simply a box without ends, and of such a width as will hold the plates conveniently. Grooves in the box receive the plates. One end of the box is formed simply by nailing upon it one thickness of Turkey-red twill; the other end is formed by the cover or lid. This cover is a wood-frame to fit on to the box, having Turkey-red twill stretched across it, so that, when the lid is on, I have a box the two ends of which are of twill. The twill keeps out the dust, while it permits the air to pass freely. The box is also provided with a piece of lead pipe at the top, which forms a chimney, and causes a draught.

The plates, when set, are placed in the grooves, which are half-an-inch apart. The lid is then put on; but the box remains in the dark-room till night. It is then taken to the topmost room in the house, and the window lifted up, and the box with the plates placed on the ledge of the window. The window may now be pulled down upon the box to fix it, and keep the box in position. The draught passes through the ends and over the plates, and the damp goes out at the pipe into the open air, causing the plates to dry quickly and evenly. If four thicknesses of the red twill be used, the box may be used in this way by daylight; but the drying takes longer.

* * *

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No. 4.—A Classical Subject.

I am going to be very much on my P's and Q's in this paper, not having a Lempriere to refer to, and try, if possible, to elude the erudite lash of the "photographic clown." So, my friends, have your Lemprieres at your elbows, for this is a very classical subject indeed, and I may err again with "Shakespeare and many moderns," in the sex of my characters.

It was only the other day that a heavy step upon the studio stairs made me hurriedly leave the retouching desk, and suddenly find myself face to face with a huge, handsome man. His features were quite classical, a perfect Greek god in patent leather shoes—dress coat and bell-topper—flashing eyes—straight nose—high forehead, and a most magnificent physique. After bidding "good morn," this type of manly strength and beauty spoke—spoke in a deep rolling voice—spoke, and at once showed me the cloven foot.

"Yer—a—make a redooction for the—a—pur-fession, I believe." Yes, we did. "Well—a—I wants to be done as 'Ercules—the twelve labours you know—poses plastique, with music and limelight. Of course you know me—Achille Talma Duffard. Been to the Hall to see me? No! Ah! I'll send you a pass for to night—an 'igh—a very 'igh and hintellectual treat, I assure you; none of your blood and murder of the Elephant and Castle order; everythink is soft, refined, and subdooed, with appropriate descriptive lecture and moosic." Here his flashing eye rested upon a picture of Ludwig, the tenor of Carl Rosa's Company, and, with a melodramatic jump, he exclaimed, "Aha! he is one of hus—his 'e not?" Upon being told who he was, he nodded with great self-complacence, adding that he was certain he was one of "hus." "What time will you find it most convenient to take me? I can come any time. You see, my entertainment is quite independent of "calls"—no rehearsals, except to see the effect in badly-constructed halls. All I have to do is to look arter my nervous system, and keep the muscles thundering large—that's wot brings down the house with me. Why, I have seen some lazy, hunapreciative haudiences, that all the soothing effect of the moosic, and the romantic halo of the lime-light, would be thrown away, and the whole thing collapse, were it not for my nerve and muscle. I've muscle enough for a dozen of men, and nerve enough to keep steady without winking an eye for an hour, if needs be; so I shows my muscle, my nerve, and my patience, and I conquers my haudience. They're bound to come if you have plenty muscle to show, and nerve to hold on—it's all a matter of time.

I agreed with the man of "thews and sinews," and requested to know the details of his costume in character.

"Bless yer! I shall have no costume—fleshings, ye know, and my club, and my lion's skin."

I thought at the moment of my Scotch cup-bearer "Shakespeare and many moderns," Ganymede—dressed in seedy black—mealy-faced—faded linen, and napkin on arm, and could not forbear jokingly remarking that to help the picturesque, and conform with the sensitiveness of the nineteenth century, he might likewise wear his tall hat or his frock coat.

This suggestion was instantly scouted by "'Ercules," with an earnestness and vituperation that would do honour to a photographic critic. "No, by Cerberus! It would never do. Some weak minds might look upon it as a joke; but he felt convinced that people—learned people—would look upon the infringement as next to sacrilege, and scorn the very idea of having Jupiter hurling a thunderbolt in a tall hat, or Ajax defying the lightning in a frock coat. No, there were things that people must not joke with, and the classical costume was one. The gods went in for simplicity—no county courts or tailors' bills in Olympia! A short tunic—a lyre—a club, or a laurel wreath, was full dress any day of the week with those glorious fellows."

An arrangement was come to, so that the sittings of "'Ercules" should take place in the latter part of the day, so that he would not interfere with the usual flow of our legitimate sitters. There was a time—some years since—that the photographing of such a subject would have deprived me of my night's rest. I would have been nightmared by chalky whites—by under-exposures—by heavy shadows—by movements in the properly-exposed plates. There was one studio that I worked in—very commonly lighted—rather a sharp angle for the ridge—but commanding an undisturbed space of sky, so that the operator could flood the sitter if need be. In this studio, by the old collodion process, using an extra strong developer, I have secured plates of children in five, four, and three seconds. I would even have my doubts of succeeding with "'Ercules," but with our swift dry plates I was confident, and felt "eager for the fray." Just for an instant let the devotee of silver bath and collodion fancy taking Hercules, when he is tearing the tongue out of the Nemean lion—when he clutches the hind with the brazen hoofs and golden horns in the forest of Parthenia—when he brings Cerberus from Hell—when he prigs the golden apples from the garden of Hesperides—when he plays smack at the centaurs—the giant Cacus and Busiris—when he relives Atlas, and works his other wonders! I fancy it would bring a cold perspiration out—a probable impossibility—and a sure collapse. Now, with the dry plates—with a second, or two seconds' exposure—even in a "subdood" light, the result is next to certain.

Thus, when "'Ercules" stripped next day, showed his muscles and his nerves, and struck his attitudes, I went to work upon each one with confidence, giving him a second and a-half, as far as I could judge, of exposure, with Wratten and Wainwright's plates. All workers of dry plates know that the most minute care must be taken with regard to the exposure and the dress of the sitter. Thus, in a case like "'Ercules," with pink tights, a short exposure may be given with safety, as you can easily mix your developer to suit it, a small quantity of pyrogallic (one grain to the half-plate), and an extra dose of bromide and ammonia bringing out the detail, and softening the whole picture. With a little attention to this (say) in the case of babies dressed all in white, a softness, a half-tone, and a remarkable amount of detail can be obtained, an effect that cannot be obtained with collodion and iron, use them how you will.

"'Ercules" was astonished at the rapidity with which I knocked off his different poses, and could not help exclaiming, "By 'eavens, yer werry smart! I likes this style of things, yer know."

I used no head-rest, and, in spite of the strained positions, there were only two movements out of a dozen of double cabinets; the results were most perfect. "'Ercules" grasped my hand in ecstacy, and squeezed it until the tears came into my eyes. I don't always please sitters so well as I did "'Ercules," and I am glad of it; that is to say, if they were given to hugging and hand-shaking, and had such biceps as Achille Talma Duffard.

◆

COLLODION *V.* GELATINE.

BY A. L. HENDERSON.*

The subject for discussion is one that is deeply interesting to all photographers, especially professionals.

That a good gelatine plate has qualities that are seldom to be found in collodion work, and *vice versa*, must be admitted. I think I need not specify these qualities; suffice it to say that the rapidity of the gelatino-bromide process is its greatest recommendation; and, although I am not an advocate for its exclusive use, I should not like to operate—in London, particularly—without the aid of the new power.

What I wish to show is the comparative prices of the two processes, and I think that, taking the collodion, bath, and all, into consideration, the collodion process should not be shelved. For some time I have carefully noted the number of plates sensitized in my baths, and the consumption of collodion, silver, acetic acid, iron, &c.; I have tabulated and arranged them down to a month, and find that I have used—

	£	s.	d.
Nitrate of silver, $6\frac{3}{4}$ ounces at 3/1	1	0	10
Collodion, 78 ounces at 6/8 per pint	1	6	0
	2	6	10

This coated 1,535 quarter plates, to develop which I used—

	£	s.	d.
Iron developer, 383 ounces of a 15-grain solution, which = about 13 ounces sulphate of iron ...	0	0	6
Acetic acid (Beaufoy's), 48 ounces	0	1	6
Acetate of lead, $1\frac{1}{2}$ ounces	0	0	3
Cost of 1,535 $\frac{1}{4}$-plates (cost of labour in coating not included)	2	9	1

I have arranged the prices of twelve advertising makers of gelatine plates, and I find that the average price per dozen of $\frac{1}{4}$-plates is $1/10\frac{1}{2}$; so that 1,535 (or 128 doz.) $\frac{1}{4}$-plates would cost 12 0 0

To this must be added—

	£	s.	d.
Pyrogallic acid, 2 grains per plate = 7 ounces at 1/5	0	9	11
Potassium bromide, $\frac{1}{4}$ grain per plate = say $\frac{3}{4}$ ounce at 4d.	0	0	7
Ammonia, 17 ounces	0	0	6
Citric acid	0	0	1
	12	11	1
Less value of glass, 3/- per gross	1	12	0
Cost of 1,535 $\frac{1}{4}$-plates (labour in coating included)...	10	19	1
1,535 $\frac{1}{4}$-plates (gelatine) cost	10	19	1
,, (collodion) ,, ...	2	9	1
Balance in favour of collodion...	8	10	0

As the quality of the glass used by the makers of gelatine plates varies so very much, I have taken it at a merely nominal value.

Now, if we take the fact that many photographers take two or three negatives of each sitter, this will increase the expenditure enormously. I am strongly of opinion that photographers are getting lazy; and yet I may be wrong, for really more work (besides loss of time in finishing and printing) is required for the gelatine process.

You will doubtless argue that most of the work can be done when no sitters are waiting. My practice is to keep two baths at work, and when we cannot get a sitter with a reasonable exposure, to make shift with a gelatine plate. I continually have photographs brought to me (taken by first-class firms) with remarks made that they look foggy. I can distinctly see the cause: they are prints from defective gelatine negatives.

---

* A communication read at the Thursday Evenings for Photographers.

I think the gelatino-bromide process will, like its predecessors Daguerreotype and collodion, only begin to be thoroughly understood when another process is discovered.

Correspondence.

PORTRAIT ENLARGEMENTS FROM OTHER PEOPLE'S NEGATIVES.

Dear Sir,—I am very glad to see you are ventilating this subject, but you have not hit the real trouble; it is this:—A print is brought, from which the photographer is asked to produce similar enlargements to those exhibited. The customer does not, once in a thousand times, dream of the need of the original negative being required, and if he did, he would never take the trouble to try to get the negative. Again, the photographer will never suggest the necessity, or even the desirability, of obtaining the negative, for fear of losing the job in case the negative is refused. The photographer may ask for a fresh print to be procured to help him. Under these circumstances, of course, a better job can be made, and even at less cost, if the original negative can be got, and it will often pay better to pay half a guinea or a guinea for the loan of the negative; that depends, however, on other circumstances. Perhaps half a guinea or a guinea is all the second photographer is going to get for all his work, and then how can he afford to pay anything worth while for the loan of the negative? Photographers just now ruthlessly live on each other, copying each other's prints and reproducing them in every way, never recognising to the customer how much better the work could be done if the original negative were employed.—Yours sincerely,

A Country Photographer.

Sir,—From my experience, which is somewhat extensive, I deduce the fact that nine-tenths of the profession decline absolutely to lend negatives for enlargement, with or without consideration. The tenth part who do lend, do it for a consideration in cash. Except in certain cases of intimate friendship, to ask the loan of a negative without consideration is to ask a very unreasonable thing.—Faithfully yours, One of a Busy Firm.

Sir,—In your last issue on the subject of Lending Negatives, a gentleman from a fashionable watering-place rambles from his subject to hurl strong language at cheap photographers—"the six shilling-a-dozen abominations," as he terms them. Just a word with this gentleman on his style of doing business (pardon the vulgarity of the word); to wit, his charging one guinea and spending thirty shillings to obtain it, is really so astounding that one would like further particulars as to its expenditure. Probably, from an æsthetic point of view, cheap photographers may be uneducated, and cannot subsist upon the too, too, delicious gazing at water lilies, &c. Stern facts in these days have to be met face to face. We cannot all play first fiddle, yet stand as high in the scale of social honesty. Did it ever occur to your correspondent that in the medical fraternity there are as great differences in professional charges as among photographers, yet the May Fair practitioner may possess no greater skill than he of St. Giles? He must also remember our clients are not all Rothschilds financially, and cannot place themselves under the white kid gloved hands of an aristocratic photographer, when giving their patronage to the art. Liberty, fraternity, equality, communism are not required by the cheap photographer, as he would naturally, as a sensible man, shrink from arrogance such as shown by the water-side autocrat.—I am, &c., One of the Abominations.

A REMEDY FOR FRILLING.

Dear Sir,—During the early part of the month of July I encountered difficulties from frilling to an extent which made it impossible to finish off a gelatine negative without partial separation of the film from the glass plate, and in one or two instances entirely spoiling the results, which had cost me much labour to produce. One picture was saved by dashing on alum at an early stage, but it gave me much trouble to fix and complete my operations, on account of the interference of this acid salt with the other chemicals employed in the process.

Desiring to avail myself of the astringent property of alumina, I thought out a plan of introducing this ingredient into the developer, and working straight away with alum in the bath, using citric acid to prevent the precipitation of the alumina by ammonia. With mixtures prepared in this manner I have developed several negatives, and carried the process of hardening much farther than would ever be desired to ensure the safety of the film, going even to the extent of getting negatives which, when wet, hardly showed any embossing of the gelatine film. I made up the following solution:—

Alum	1 ounce
Citric acid...	$\frac{1}{4}$,,
Ammonia fort. (·880)	$\frac{1}{2}$,,
Water	16 ounces

It is well known that an alkaline citrate prevents the precipitation of alum by ammonia, so that we have here a method of introducing alum into the ordinary developer without upsetting the alkaline conditions so necessary in the first stage of flooding the plate. The negative develops wonderfully clean, the picture comes up a trifle slower, but there is no trace of frilling. The citrate appears to act as a restrainer, so that it may be possible to work with pure pyrogallic acid and the above-named solution. On this point there is room for further experiment, but as we may at this season expect a return of tropical weather, your readers would be glad to know of an infallible remedy against frilling.—I remain, dear sir, yours very truly,

John Spiller.

PS.—On the 9th July I developed a capital negative on a plate exposed just one year before in the Isle of Wight. Have any of your correspondents kept an exposed plate longer than this period?

SPECTRUM IMPRESSED ON GELATINO-CHLORIDE OF SILVER EMULSION.

Sir,—I have read with interest Captain Abney's short account of his investigation into the action of the various parts of the spectrum on gelatine films prepared with silver chloride, and more especially because his results so fully bear out my conclusions, arrived at in an unscientific, but perhaps fairly practical, manner several years ago.

It may be remembered that a short time ago Dr. Eder, in your columns, stated my conclusions to be false at every point; but as Dr. Eder is considered an authority upon such matters, I felt it to be useless to write further unless I could bring actual proof of my assertion. This Captain Abney now supplies, he having found the action of the spectrum to decrease rapidly to the line D in the orange rays, while the greatest action was apparent at and above line H in the violet, and not, as with silver bromide, at about line G in the blue. But let me hasten to admit that though Captain Abney has experimented upon "cooked" emulsions, he may not have yet happened upon a suitable plate of chloride for exhibiting the characteristics Dr. Eder appears to have observed, viz., no falling off of sensitiveness towards the less refrangible rays in comparison with silver bromide I certainly, in the light of our present knowledge, did not use such preparations, and I stated this in my letter published by you several weeks ago.

Not unlikely, Dr. Eder and myself are both, under certain conditions, correct, though at present Captain Abney's results favour my views of the matter. Generally speaking, and with equal treatment, I have no doubt the bromide will register further into the less refrangible rays than the chloride; but I am quite ready to admit that should special treatment of the chloride reverse the usual characteristics, I have no longer any ground for placing chloride after bromide in this respect.

I have made many trials with chloride emulsions, having been the first to show that silver chloride can be successfully developed by the alkaline developer, provided the vehicle be gelatine; and I am moreover well aware that with uncooked gelatine emulsions, of both chloride and bromide, made under similar conditions, the difference of sensitiveness is slight indeed with most classes of open, well-lighted subjects. I am quite prepared to find that with the "cooked" emulsion—especially with ammonia—the case may be very different. I think it quite likely that as the sensitiveness, and consequent coarseness, of the chloride is increased, so will it become less possible to use the alkaline developer upon it; and with other developers I know not what the result might be. Some years ago I showed that sensitiveness and coarseness went together; at least, that great sensitiveness is always accompanied by comparative coarseness; that fineness of division is not favourable to "sensitiveness" (or amenity to development), as was commonly supposed. Now when the chloride is no longer fine, giving a transparent plate, but comparatively coarse, the gelatine can no longer exercise the same powerful restraining (for it will not lower practical sensitiveness) action. The particles are not isolated, and the film becomes more pervious to the developer. Such conditions may entirely alter the comparative sensitiveness of silver chloride and silver bromide, for not unlikely the alkaline developer can no longer be used.

The foregoing is with reference to general sensitiveness. Captain Abney's researches throw light upon the comparative sensitiveness to special rays.

Though the vehicle may unduly restrain this action of the developer, it is of the first importance in the cause of sensitiveness that it restrain the central, or what is called "abnormal" reducing action of the developer. Dr. Eder's preparations appear to approach in character silver chloride in a collodion film. Silver chloride, I need hardly point out, requires more—much more—than a "vehicle;" it requires a very strong physical restrainer, otherwise the action of light upon it will appear *nil*, owing to the general reduction produced by the developer.

A few words upon the use of excess of silver nitrate when forming an emulsion. It seems likely to become a generally received idea that if excess of silver nitrate does not produce an emulsion showing at the outset the dreaded "red fog," which is known to be produced by too long digestion of the gelatine in the presence of the nitrate, but the films so prepared develop cleanly, the plates may be depended upon not to deteriorate—except perhaps, in sensitiveness.

My experience in 1876—77 was that plates could not be depended upon to remain many days in the pristine state; they not only in some cases lost sensitiveness in ten or fourteen days, but they developed red fog also, and this though all free nitrate had apparently been washed out. It is thus evident that a change may take place in the dried film, and that of the most annoying kind. Probably this organic compound is slowly reduced, though to me it seems strange that the alkaline developer does not effect this on the plates when freshly prepared. Some plates, prepared with emulsions made with excess of nitrate, and then washed, have, though faultless at first, developed a red fog plainly visible before development.

It is possible that the treatment with the ammonia-nitrate of silver may lead to different results. It would seem advisable to test the effect of excess of silver nitrate upon a precipitated silver bromide, the gelatine being added after washing. As for the possible formation of sub-bromide, I do not suppose this is more likely to occur than when gelatine is present.

I observed no alteration in sensitiveness when the free nitrate had been converted by soluble bromide. Whether the benefit of silver nitrate is due to the influence of its actual presence, or to some modification brought about by it, which remains after it has been removed, seems doubtful.—I am, &c., Herbert B. Berkeley.

FOG IN GELATINE PLATES.

Sir,—It sometimes happens that on developing a gelatine dry plate, the negative has a red transparent fog; when fixed, it is almost a positive on a red ground. If the picture be good in other respects, the negative is not valueless, for the fog may be removed by treating the negative first with a strong solution of bichloride of mercury, and afterwards with diluted hydrochloric acid (ten drops to the ounce). By this treatment a soft—almost too soft—negative is obtained. The mercury salt does not intensify in this case, and if the negative be undeveloped, it does not come out strongly enough.

Should this communication be worthy of insertion in your journal, I shall be pleased to have communicated something in return for the good advice I have received through the News.—Yours, &c., Otto Pfenninger.

PHOTOGRAPHS OF LIGHTNING.

Dear Sir,—Noticing a communication from Mr. W. W. Mitchell in your last issue, describing a photograph of the lightning flashes, I have sent you one taken same date (July 5th), at 10.30 p.m., looking due east. There are eight or ten distinct flashes.—Yours truly,

Charles Kerfoot Dalton,
Hon. Sec. Bolton Photographic Society.

[The electric fluid, represented by well marked vermicular lines, is most plainly limned in the picture, which resembles Mr. Mitchell's print very closely.—Ed. P.N.]

Proceedings of Societies.

Manchester Photographic Society.

The fifth out-door meeting of the above Society during the season took place on Saturday last at Prestbury, a pretty little village near Macclesfield. Although the meeting was not so numerously attended as some of the previous ones had been, those present enjoyed it very much. The weather was good, with a brilliant light, without being too hot, and there was very little wind; so that excellent opportunities were afforded for successful work. A very enjoyable tea was provided at the Black Boy Inn, and the members returned by the 7·15 train, without any particular cases of adventure.

The next meeting will be to Taseal, on August 13, by the train leaving London Road station at two o'clock.

Thursday Evenings for Photographers.

At the meeting held on the 28th ult., Mr. A. L. Henderson in the chair,

Mr. Cowan demonstrated an easy method of calculating to a fixed scale the apertures for the stops of any lens of any focal length, which he had worked out from a suggestion by Mr. H. Wilmer.

Mr. A. Clarke said, by diluting the developer and giving plenty of time, he could obtain any amount of density in a thinly-coated gelatine plate.

Mr. Henderson had had the same experience.

The Chairman then read a paper entitled, "Gelatine *versus* Collodion" (see page 369). Discussion was, owing to the lateness of the hour, adjourned until the next meeting.

Mr. Clarke said a negative was exhibited on the previous evening by Mr. Mawdsley, taken on a gelatine plate that had been to Texas and back, and, notwithstanding that a bottle of liquor ammonia packed in the same tin-lined case was broken during the voyage, the sensitiveness of the plate did not seem to have been at all impaired.

Talk in the Studio.

A Balloon Garden Party.—At the second annual festival of the Balloon Society, held in the Lillie Bridge grounds last Saturday, a very large number of persons assembled; but the comprehensive programme, including experiments in free and captive balloon photography, was, unfortunately, much curtailed, owing to the somewhat unfavourable state of the weather. The new balloon, "Lillie," belonging to Captain Simmons, called forth many expressions of admiration, it, like the great Paris balloon, being made of macintosh cloth; and it is estimated that this aerial ship will carry nearly three-quarters of a ton. Mr. Cobb was to have ascended with this balloon, armed, as usual, with the most rapid of plates and the quickest of shutters; but, at the last moment, he concluded that there would be no reasonable probability of obtaining satisfactory results, so he did not make an ascent; and the aeronaut was accompanied by Colonel Brine and Mr. Baden Powell. A pleasant journey across the Western and Central districts of the metropolis and over the fields of Essex was terminated by a safe descent near Hutton Rectory.

South London Photographic Society.—The first out-door meeting of the recess took place on Saturday last, the proceedings being terminated by a social gathering at the Star and Garter, Kew Bridge. After the repast was over, and the usual jokes about clearing plates and the coffee process had been duly put forward, the Rev. F. F. Statham made a kindly speech, in which he referred to the recent progress of photography, and those who had laboured in promoting its advance. The good health of the President, and other toasts were next honoured by copious draughts from the foaming tankard, and arrangements for the ensuing session were discussed; Mr. Wilkinson promising a paper for the first ordinary meeting of the Society.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper and Carter, *and crossed* "*Union Bank, Photographic News Co. Account.*"

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 2. On Sending Out Proofs; What I do, and Why I do it," to be sent in by the 1st September. No name need appear. For rules, see previous numbers of the News.

E. D. G.—1. It is probable that you have had the so-called methylated finish given you instead of methylated spirit. The "finish" contains a certain proportion of gum sandarac, and it is probable that this resinous material has done the mischief. 2. The most certain way would be to make a new bath, and to precipitate the silver from the old one.

Cameo.—1. If a woman can do useful work in the direction you mention, she should obtain pay at once; but if, on the other hand, she is likely to spoil materials in learning, a proportionate premium must be paid either in money or in time. 2. In many cases no premium would be required, provided that the lad would make himself generally useful.

R. R. F.—1 and 2.—Full directions in current Year-Book. 3. The width and length being as specified by you, a height of 8 feet would suffice, and a slanting top might be dispensed with if one side be glazed. 4. The following Year-Books are in print:—1871-1875, 1877-1881.

Amateur (Kilkenny).—1. Any dealer in photographic chemicals would obtain it for you. 2. About five shillings per pound.

F. M. C.—It is necessary to use a fairly good condenser, and the usual form consists of two plano-convex lenses mounted with convex sides next each other (see A, fig. 3, page 290 of present vol.) The light, condenser, and objective should be so placed in relation to each other that the image of the light produced by the condenser is formed exactly at the optical centre of the objective. In the case of a portrait combination, we may take the position of the diaphragms as the optical centre.

Ferrotyper.—Your bath has probably become disordered. Use it as fresh as possible; expose freely to the air, so as to allow alcohol and ether to evaporate. Leave your plate in as short a time as possible, moving it constantly from side to side, or up and down, to facilitate sensitising. Read Mr. Heighway's articles which recently appeared in the News. Do not over-expose. Add two or three drops of nitric acid to each ten ounces of bath. Write again if you have further trouble.

Otto Pfenninger.—Your claim is against the dealer who supplied the plates, not against the manufacturer, and the dealer will arrange with him. There can be no doubt, however, that if you write demanding fresh plates they will be sent at once, the firm being a respectable one. The defective ones you must return or deliver to their order as they may arrange. The vignette portrait you enclose is very pretty and effective.

Typographer.—Obtain Captain Abney's "Instruction in Photography," and practise the elementary operations until you have overcome the principal technical difficulties. You will then be in a position to study the special photo-mechanical methods.

B. J. G.—1. If you believe all that has been written on the subject, your creed will, indeed, be a mass of contradictions. 2. A moderate excess will serve the purpose—say one-tenth more than is actually required to effect the decomposition. 3. An ordinary printer's ink is used. 4. A solution of caustic soda in alcohol.

H. L. T.—The stains and markings can be effectually removed by pouring on a fifteen-grain solution of potassium cyanide; and all traces of this salt must be removed by plentiful ablutions, distilled water being used for the final washing.

Thomas Burdock.—When manganese dioxide is present, a much lower temperature is sufficient, the heat from a small Bunsen burner serving for the complete decomposition of the salt in six or eight ounces of the mixture.

Brighton.—It is not easy to advise without knowing more regarding the conditions under which the transfer was made. It would be advisable for you to lay the whole case before a respectable solicitor.

Carbon.—If you obtain a genuine sample of yellow wax, and take care to leave a rather large quantity on the plates when they are used for the first time, your difficulty will be overcome.

William Bell.—It is highly probable that your dark lantern is not safe. Expose a partly-covered plate to the light, and apply the developer.

Jones.—1. It was exhibited at a meeting of the Photographic Society about two years ago. 2. We believe that it is not patented.

Cambridge.—The method is rarely or never practised in the present day, as more convenient and economical processes are now available.

Wilkins.—You evidently expect too much from the lens, and we should advise you neither to sell it nor to exchange it for another.

Pyro.—1. Not less than fifty cells of Bunsen's battery are required to produce an arc light of sufficient intensity to answer your purpose. 2. The sample of pyroxyline is partly decomposed, and quite unfit for any photographic use whatever.

Dry-Plate.—The use of an extremely hard water—that is to say, water containing a large proportion of lime—is generally undesirable, as it tends to cause decomposition of the pyrogallic solution, and gives rise to a precipitate in the ammonia solution. Sometimes, however, it is advantageous to wash in hard water, as when this is done there is less tendency towards frilling.

LOCAL PATENTS.

This List of Patents is specially compiled for the Photographic News, *by* Messrs. Des Vœux and Colton, *Patent Solicitors and Engineers*, 32, *Southampton Buildings, London, W.C., and Imperial Chambers, Albert Street, Derby, of whom all information, including pamphlets of instructions, may be obtained.*

Applications.

William Henry Beck, of 139, Cannon Street, "A New or Improved Printing-Frame for Obtaining Photographic Prints."—A communication to him from abroad by Paul Piquepé, otherwise Morgan, of Paris, Photographer.

Captain John Bailey Holroyde, of The Hollins, Warley, near Halifax, "An Improvement in the Mode of Taking Photographic Negatives, whereby they are rendered flexible, and the use of Glass is dispensed with."

Charles Sanns, of 20, Cranbourne Street, Leicester Square, "An Improved Instantaneous Photographic Shutter."

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1197.—*August* 12, 1881.

CONTENTS.

	PAGE
Optical Arrangement for Enlarged Pictures	373
Landscape Lenses	373
Out-door Photography. By Dr. H. W. Vogel	374
By-the-Bye—A National Photographic Portrait Gallery	375
A Good Tone. By Dr. J. Schnauss	376
A Visit to the Musee Industrielle, Brussels	377
Notes	378
Topics of the Day—After-Treatment of Gelatine Negatives. By George Croughton	379
The Relation of Photographers to the Public, and the Public to Photographers. By H. Rocher	380
Measuring Duration of Exposure by Shutters. By A. Haddon	380
Lux e Tenebris. By Photo-Chemicus	381
Odds and Ends from the Antipodes. By J. J. Chidley	381
Correspondence	383
Proceedings of Societies	383
Talk in the Studio	384
To Correspondents	384

OPTICAL ARRANGEMENT FOR ENLARGED PICTURES.

There are few operations incident to commercial photography which have been discussed more earnestly than the production of enlarged pictures, not only as regards the apparatus employed, but also with respect to the processes to be adopted for the production of the sensitive surface and the transparency. In the present article we intend to confine ourselves to a discussion of those simple optical arrangements which are required for enlarging by daylight, leaving a consideration of other devices for subsequent consideration.

The old-fashioned double-bodied enlarging camera is oftener seen in "counterfeit presentment" in old books and trade lists than in actual use. It consisted of two large sliding body cameras joined together face to face, and was mounted on a colossal stand provided with a joint intended to allow one end of the apparatus to be elevated towards a white cloud; the end directed upwards carrying the transparency or the negative to be enlarged, while the other end took the dark slide. The extreme clumsiness of such an arrangement, and the difficulty of supporting it steadily by any stand of moderate weight and reasonable proportions, to say nothing of the gymnastic evolutions which had to be gone through in order to charge it with a fresh transparency, caused it soon to be replaced by the simpler arrangement now in extensive use.

Let us note how the several parts of the old apparatus are modified or replaced in the present day. First, an evenly illuminated background is required to take the place of the cloud, and this is furnished by a sheet of white painted canvas, mounted at an angle of 45 degrees in front of a rectangular aperture in the wall of a room which can be darkened at pleasure; or this opening may be made in a shutter constructed so as to fit into the window frame. Close against this aperture, and inside the room, is fitted an ordinary camera, the lens being directed towards the interior of the apartment. The transparency or small negative being now placed in a suitable carrier, the image is formed by the objective and focussed on a screen. With respect to the easel or plate-holder, the best method is to provide a pair of rails, like tramcar rails in miniature, and imbed these in the floor of the room. A carriage bearing the easel runs on these rails, and it can be fixed at any point by lowering a lever armed with a sharp steel point, which just enters the woodwork of the floor. As regards perfection of results, whether one wishes to make an enlarged negative from a carbon transparency, or to enlarge from a small negative on sensitive paper, the abovedescribed arrangement is equal to any, and much superior to most methods involving the use of condensers. Any objective may be used, but the exact kind selected will depend on circumstances. In dull weather, time being an important consideration, a portrait lens will be selected, especially when the subject is one in which fine definition at the edges is of secondary importance. If, on the other hand, extreme definition is required all over the plate, a lens of the symmetrical or rectilinear type will be employed; while should it be necessary to correct pin-cushion or barrel-shaped distortion, a simple view lens will be most suitable.

It may happen that direct sunlight can be obtained on the white painted canvas or artificial cloud, and if this is the case, a very considerable gain in rapidity is effected, so that one may, without unduly prolonging the exposure, make a four-foot wet collodion negative from a five or six-inch transparency. When the sky is uniformly lighted, a looking-glass may take the place of the white painted canvas, but in this instance it is virtually the same thing as if the whole apparatus were tilted, and the transparency directed towards the sky. Any cloud partially covering the field might in this case give rise to an irregular action, as the lens would, in some fashion, form an image of it. Some enlargers who use the looking-glass place a sheet of fine ground-glass about an inch from the transparency on the mirror side. This thoroughly breaks up the rays, and becomes itself the artificial cloud, or the immediate source of light.

In a subsequent article, the various methods of enlarging with the aid of condensers will be considered.

◆

LANDSCAPE LENSES.

In writing on the subject of portrait lenses a short time ago, we pointed out the qualities desirable in these and in landscape lenses? that what is chiefly required in the latter is exquisite definition in different planes all at some distance from the lens, and the possibility of including a comparatively wide angle of view. Then these qualities we pointed out necesssarily included flatness of field, as without such it is impossible to have good marginal definition when a considerable angle is included.

The modern "wide angle" single lens admirably fulfils all these conditions, and is in every way the best, as it is the simplest lens to use when none of the following qualities are required:—(1) very great angle, (2) great rapidity, or (3) absolute absence of distortion. For pure landscape work none of these three qualities are requisite, and hence for such the single view lens is unequalled. The fact that it has but two reflecting surfaces makes it give a more brilliant image than any other form of lens with the same aperture, while the simplicity of its form enables it to be sold at a reasonable price.

It may be worth while to see why the particular form of a meniscus of large size with a diaphragm placed at a considerable distance in front of it was adopted. Considering the small aperture used, it appears at first sight as if there were a great loss of glass involved.

The simplest form of lens, and that which was first used in the camera, consisted of a double convex lens and full aperture. Such a lens had many drawbacks. It might or might not be achromatized; but whether it was or not, it was a very imperfect form of lens. It possessed excessive curvature of field, and very considerable spherical aberrations. The means naturally resorted to to counteract these drawbacks consisted in stopping down the lens to a very small size by the simple means of covering it with opaque paper or colouring matter, with the exception of a small central part. That is practically reducing it to a lens of very small diameter. This got over entirely the difficulty of spherical aberration, and made the want of marginal definition due to curvature of field less evident. In fact, quite recently, Captain Abney has pointed out that such a lens may be used with perfect success so long as the angle of view is very limited, but not otherwise, because to gain marginal definition with any considerable angle the stopping down would have to be carried to extremes.

To overcome this difficulty, the form of view lens still used, and generally known by the name of the "single lens," although in reality it is composed of two, or sometimes three, distinct lenses cemented together, was introduced. This consists of a lens of large diameter, of either the plano-convex or meniscus form, with a stop placed at a considerable distance in front of the lens. By means of this device flatness of field through a considerable angle is obtained. Spherical aberration is not, however, reduced, but, on the contrary, considerably increased, so that such a lens has always to be used with a comparatively small stop, not so small, however, but that the rapidity is quite sufficient for general landscape purposes.

With the older forms of single lenses, where only two lenses were cemented together, it was usual not to permit the use of an aperture more than from a twenty-fifth to a twentieth of the focal length. With the newer form of lens, however, in which three lenses are cemented together, the aperture may be increased to one-fourteenth of the focal length, while the angle is much increased, in fact, from 45° to 60°.

With the flatness of field which the meniscus lens, with a stop placed at some distance in front of it, secured, another feature was also introduced, which, although it does not interfere with the usefulness of the lens for pure landscape work, renders it unfit for certain classes of architectural work, or for copying, where great exactness of reproduction is required. We refer to *distortion.*

A lens of small diameter, using full aperture, has the advantage of giving an absolutely correct representation of objects, as far as form is concerned; but when the stop is placed at some distance in front of it, the rays which form the margin of the picture, being bent inwards, do not focus upon the points which would correctly represent their position, but on points too near the centre of the plate; in fact, the margin of the picture is to a smaller scale than the centre. This has the effect of representing lines near the margin of the plate, which should be straight, as curves, and of giving a barrel-shaped appearance to objects which are bounded by straight lines. The consequences are, that with single lenses great care must be used in attempting architectural subjects, especially with wide-angle lenses, because the misplacement of a point increases enormously when a certain angle is exceeded.

One common mistake in regard to distortion we would here remark upon. It is very common to hear it said, when lines which should be vertical in the photograph of a building are seen converging, "Oh! the effect of using a single lens." We remember hearing this remark at the Photographic Club some time ago, when some photographs of public buildings were shown. The idea is a completely mistaken one. The appearance is not produced by the use of a single lens, but by the tilting of the camera, and would result to exactly the same amount with a rectilinear lens as with a single one.

The first attempts to overcome distortion resulted in the form of lens known as the "orthoscopic," which consisted of a meniscus lens of large diameter with the concave side towards the ground glass, and another meniscus of smaller diameter nearer the ground glass, and with its concave side turned in the opposite way to the larger one. This reduced distortion considerably, and enabled a somewhat wider angle to be used; moreover, it altered the nature of the distortion, the marginal parts of the picture being, in this case, to a *larger* scale than the central part.

The next improvement upon this was the form known as the triplet. In this, all distortion was overcome, and again the angle was somewhat increased; besides which, the working aperture was increased, and consequently greater rapidity gained. Both these forms have been superseded by the rectilinear and symmetrical lenses, which consist of two combinations, generally meniscus with the concave sides next each other, and with a diaphragm placed between them.

Such a combination may be said to consist of two single lenses so placed that the distortion of the one counteracts the distortion of the other. The spherical aberration is considerably less than with the single lens, so that, with the same angle, they may be used with a larger aperture, whilst by using a small aperture a greater angle may be secured than is possible with a single lens.

We hope shortly to enter more fully into the question of double combination lenses, distinguishing between the forms known as universal, rectilinear, symmetrical, and wide-angle.

◆

OUT-DOOR PHOTOGRAPHY.

BY DR. H. W. VOGEL.*

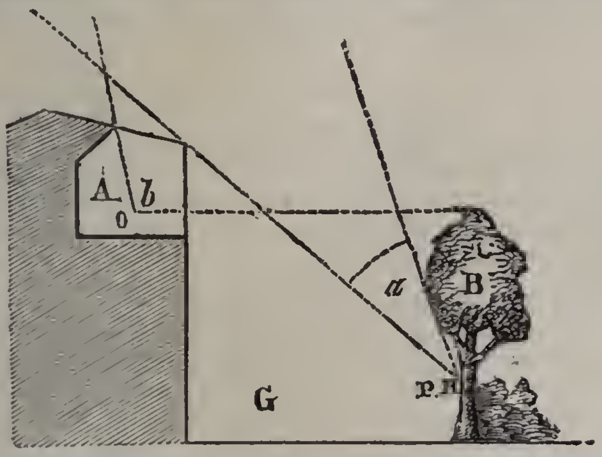
Some time ago a photographer received an order for a photographic copy of an oil painting. His first attempt he considered satisfactory, but the painter of the picture who had given the order was not pleased with it. The painter asked the photographer whether he had taken the photograph in his studio, and on receiving a reply in the affirmative, he declared that Goupil, of Paris, worked always in the open air, and recommended the photographer to do the same. Unfortunately, this second attempt, which the photographer made on the leads adjoining his studio, was not successful, so a third attempt was carried on in the courtyard on the ground floor. To his great surprise it required a much longer exposure than in the studio, and the result was not nearly so good as that of the first attempt indoors.

Now there is no doubt that Goupil takes the large majority of his copies of oil paintings in the open air, also that an out-door photograph, as a rule, can be taken with a much shorter exposure than one obtained in the glass-room. That the latter, however, is not always the case, is not only shown by the example of the oil picture just given, but agrees with the experience of a former pupil of my own, who, trying to take a group in the garden behind his house, also found a much longer exposure necessary than in his studio. This apparent anomaly can be explained by local circumstances, and since these have a great importance in out-door photography, I should like to go into the subject with a little more detail.

Thirteen years ago I wrote a series of articles for the *Notizen*, in which I developed my ideas on the principles of lighting and construction of a photographic studio. Afterwards, these articles were considerably expanded, and incorporated in my "Manual of Photography." In them I explained that it is the sky from which the studio receives all the effective light, and that the photographic illumination of a point depends, in the first instance, on the extent of sky visible from that point. If we want to work out of doors, and take our stand on a roof higher than the roofs of all the neighbouring houses, we are practically illuminated by the whole sky, but this is not so in a studio, though it may be situated at the same height. Both the side walls, as well as the back wall, parallel to the glass wall, cut off a large portion of the sky, and the more the curtains are drawn together in order to obtain an artistic effect, the less is the effective light of the sky, and the longer must be the duration of the exposure. It is quite possible to obtain an idea of what is the degree of illumination of an object, not only in the studio, but also under other circumstances, by considering what is the size of the effective sky space; we shall then, without mathematical calculations, easily see that the conditions under which the light is able to penetrate may, in certain cases, be much less favourable in the open air than they are in the studio.

---

* *Photographische Notizen.*



Suppose AB to be the section of a studio and its adjoining garden, the glazed portion being indicated by finer lines; it will be seen that the point O receives its illumination from all parts of the sky which are included between the legs of the angle *b*. On the size of this angle, the *light-angle*, as I call it in my treatise, depends (all other circumstances being equal), the degree of illumination of the point O. Now, let us take a point P, in the garden, below the studio, and underneath the tree B; in this case, the greater part of the effective sky space is cut off by the wall of the house on one side, and by the tree on the other, so that only the small portion of the sky enclosed between the legs of the angle, *a*, illuminates the point P, and the light-angle, in this case, is not so much as ½ of that in the other. It is, therefore, not surprising that, under such circumstances, an exposure in the garden must be much longer than one in the studio.

Still more unfavourable will be the condition in the open air, when, besides the high wall in front, there are also side buildings, which further contract the effective sky space, and which, of course, have an injurious effect in proportion to their height.* It is, therefore, not to be wondered at in such a case as the one above mentioned, where the court-yard was surrounded with lofty buildings, that the exposure required for photographing an oil-painting was much longer than that for the same purpose in a studio erected on the roof, although in the latter a portion of the light was lost by reflection from the glass walls, and by absorption by the more or less dirty panes.

In Goupil's establishment the arrangements are not open to these objections. He photographs in a garden which is nearly quite open, so that he has the benefit of nearly the whole of the sky space. In bad weather he works in a garden pavilion which is glazed on all sides.

Similar conditions obtain in landscape photography. When taking views in the Carpathian mountains, I found twenty seconds of exposure was quite enough for an open landscape, lying in a narrow valley; but, directly afterwards, in the valley itself, for a picture of a waterfall, I had to expose for two minutes; and with a wet plate, under tolerably thick foliage in the interior of the wood, five minutes was not too much.

In all these supposed cases I have taken for granted that the light itself was of the same intensity; but if that condition is not fulfilled, there will be marked differences to be taken into consideration. Every one must have observed, when April showers are prevalent, that a side-light of the studio may be open to a dark cloud, while a white cloud shines through the top-light. Under such circumstances, no effect of side light will be obtained at all; for only the top-light is effective, so far as photographic purposes are concerned. In such a case, to get a "Rembraudt effect" is out of the question.

By-the-Bye.

A NATIONAL PHOTOGRAPHIC PORTRAIT GALLERY.

When are we to have a national photographic portrait gallery? Years roll on without any of the practical suggestions for the formation of such a collection assuming any tangible shape, and when at last the real importance of such a gathering comes to be understood, many of the valuable portraits now extant will, in all likelihood, be lost or scattered beyond recall. Mr. Maclachlan, of Manchester, was one of the first to call attention to the desirability of making a national collection, and since then many have spoken in its favour. At first the objection made to the course was the instability of photographic prints and the undesirability of disbursing public money for pictures which, whatever their importance at the time, would rapidly deteriorate and become valueless. Another less pronounced reason was, that the portraits would not necessarily be true; on the one hand, they might be monstrosities, or on the other, retouched out of all knowledge. This last objection need scarcely be regarded seriously. If photography is open to the charge of untruth, how much more so is painting! We may come across a photographic portrait now and then which provokes the remark, "I hardly should have known him"; but, with respect to a painted portrait, this is invariably regarded as a success if it only contains a "something" that is in the original. The occasional "un-likeness" in a photographic portrait is but the exception that proves the rule, and, unless there is every intention to deceive, it would be hard to pourtray a man or woman with the camera whose portrait would not be recognized by friends. We say "friends" advisedly; for, as every photographer knows, nobody's dictum can be taken about his own photograph. Nine times out of ten, with dissatisfied sitters, it is the clothes, and not themselves, that is disliked; and nine times out of ten too, it may be said, a portrait at first disliked comes into favour after the sitter has grown two or three years older.

But to return to the idea of a national photographic gallery. There is no reason why it should not be placed under the authority of some of our great painter artists, if any fear existed on the score of injudicious retouching or finishing. All that is wanted is a small committee of capable men, who would take care that the photographs are likenesses, and that they are permanent. Being independent of the person pourtrayed—for few men care a straw about other men's good looks—they would be satisfied with most negatives taken in our good studios, and would scarcely object to the moderate amount of retouching usually resorted to. There would, indeed, be no incentive for pushing retouching to extremes. Where the pencil or brush is used to excess, it is with the full consent of the sitter, and photographers would certainly never expend money on expensive touching if the work was not appreciated. This lady of forty-five is quite sure the wrinkles on her forehead are not so perceptible as in the photograph; and the gentleman of fifty may be bald, but not so bald as all that, he tells you. So the photographer must set to work and produce a portrait after the sitter's own mind. But, in the event of preparing pictures for a national gallery, there would be only the desire to furnish a thoroughly good photograph, and we might be quite sure that, as the public is to be his judge, the photographer would use his best ability to send in a portrait that visitors would readily recognise.

---

* It is scarcely necessary to point out that the light angles, *a* and *b*, only show the effective sky space so far as breadth, and not length, is concerned. To get an idea of the latter, it would be necessary to have another section of the surrounding buildings in a plane at right angles to that of the paper. The extent of the effective sky space can be mathematically determined by spherical trigonometry, though in practice this is scarcely necessary; a rough estimate by the eye of the comparative sizes of the angles will be quite sufficient.

The question of permanence is, of course, all-important, and we grant it would have been foolish to organise a collection of portraits of a fleeting nature. But at the present day there are many permanent processes to choose from. Besides several photo-mechanical printing processes—such as the Woodburytype, photo-engraving, and collotype, which might possibly be objected to, for the reason that they scarcely produce pictures of the requisite size—there are several everyday methods on which reliance could be placed. The most recent is platinotype, the tone of which has not failed to secure warm encomiums from painters and draughtsmen. Mr. Spiller, the best living authority we have, declares platinotype to be permanent, and it is, in fact, difficult to see how a deposit of pure platinum—for the platinum black, of which the picture is composed, is nothing more than finely divided platinum—could well be attacked under ordinary conditions. Printing in pigments or carbon would be another plan of securing portraits for a national collection, and this plan would have the further advantage of placing at the disposal of the directors or trustees of the gallery a choice of tint or tone, from jet black to light red, deep purple to pale blue; only, in making choice, it would of course be necessary to select a pigment upon whose trustworthiness, in the matter of non-fading, implicit reliance could be placed. Further, there is the possibility of burning-in photographic portraits upon enamel or pottery, in case paper prints were objected to, so that the charge of "fleeting" can no longer be supported against photographic impressions.

Of course, there still remains the question, "is it worth while?" What does it matter whether we have true portraits of our great men, so long as we have their works? Truly, it matters little from one point of view; but then we might as well argue, is anything worth while in this world of ours? We can hardly take an interest in a man's work without taking an interest in the man himself. Nay, more; a man by his words or deeds may not only create an after-interest in himself, but in objects and things around, which would be without history but for his touch. There are Englishmen who visit Verona, for the mere sake of looking at the tomb of Romeo and Juliet outside the town, whose only existence is due to Shakespeare's pages. The Katskill mountains and the green-shored Hudson are attractive spots, but to none more so than the readers of Washington Irving. Travellers flock to Florence to visit Dante's birthplace; Protestants journey through the black pine forests of Thuringia, to gaze upon the old Wartburg Castle, in which Martin Luther translated the Bible. Soldiers go to Waterloo, to remind them of Wellington; and yachtsmen cruise the blue Levant to dream of Byron and his "Maid of Athens." That most commonplace and grimy of burial grounds, Bunhill Fields, is the object of frequent pilgrimages, because it contains all that was mortal of dear old Robinson Crusoe; and people still wander about odd nooks and corners of London, simply because they were the home of some of Charles Dickens' characters.

If, then, we have so deep a love for spots upon which the shadows of great men have fallen, how keen would be the interest in portraits painted by the same shadows during lifetime! To have the features before us, not transferred by brush or chisel, but the actual shadow reflected from the living man while yet in possession of health and strength; to have him before us as he looked, and smiled, and drew breath. A photograph of Shakespeare, of Dante, of Defoe, of Martin Luther would of themselves constitute a gallery whose interest would be greater than any storehouse of art in the world; and if these are out of reach, let us not lose such as may still be had for the asking. Wellington and Washington Irving may have been depicted in the camera; but, if so, the portraits are not forthcoming, and it is the same with many other great men who died during the first half of the present century. Every day that closes adds to the difficulty of making a complete collection of all whose photographs are the only shadows left to us.

The "At Home" next week will be "Messrs. Alexander Brothers in Renfrew Street, Glasgow." The following "By-the-Bye" will be "Pawnbrokers' Bargains."

A GOOD TONE.

BY DR. J. SCHNAUSS.[*]

A good tone is as valuable in the products of the photographer as it is in society, but there is a not unreasonable complaint made by many people that this desirable quality is greatly wanting in the latter case. Let us photographers, then, be careful that it may not be justified in the case of our work.

On looking at a show-case of photographs, or at the numerous albums of our acquaintances, everyone must be struck with the almost universal brown tone of the pictures; very seldom is a more delicate purple tint met with. Certainly this general brown colour is better than the sample cards of all the shades which can be obtained by means of soda and gold baths that were so common when albumenised paper was first invented, but there are other tones more agreeable to the eye, and not difficult to produce. In this respect the Americans distinguish themselves, for by means of the fuming with ammonia which prevails among them they are able, without any great trouble, to render much warmer tones of purple and bluish black, playing into rose colour in the more delicate shadows. For several years the photographic press in Germany has been silent on the subject of toning baths, though formerly, when albumenised paper was first introduced, it was a constant topic in our journals. Complaints used to be rife of the difficulty of toning albumen copies, in comparison with the ease with which it was effected in the case of salted paper; and new formulæ were continually being brought out for reducing this difficulty. In the days of our childhood it used to be the practice to obtain a black tone by—*horribile dictu*—acidulating the soda bath, which of course did not contribute to the permanence of the pictures; even the gold bath was made to have an acid reaction, and it was only when albumenised paper came in that the toning bath was made alkaline.

I cannot allow this opportunity to pass of mentioning an observation, the correctness of which every practical photographer will admit, though few probably have actually paid any attention to it—namely, that the greatest improvements in our art in its various branches date from the period when, instead of the acid solutions at first employed, alkaline solutions were introduced. Look at the developing operation in the dry process—mark how long this process remained imperfect as compared with the wet process, until we had recourse to alkaline development. Even the most sensitive collodio or gelatino-bromide emulsion would be of no service without the alkaline developer. The same in the copying process; it only reached its present state of excellence when the alkaline toning bath was employed, and this was still further improved by the introduction of fuming with ammonia.

Manufacturers of albumenised paper take pains to prepare them in such a way that they admit of being manipulated with weaker gold and silver baths, for the albumenised papers of the present day are generally less strongly salted, and mostly doubly albumenized; moreover, a bluish-black tone is now not so much asked for by the public, and the brown tone seems to be generally accepted. For this reason photographers are able to benefit their pocket by using weaker gold and silver baths. It must be recollected, however, that the price of photographs has been lately considerably reduced, and that since the introduction of the carte-de-visite, the photographer relies for his profit on the increased number that he sells.

---

[*] *Zeitschrift fur Praktische Photographie.*

Fuming with ammonia not only permits the use of much weaker gold and silver bath, but also gives the prints a soft plum blue tone, fining off into a rose colour in the most delicate half shadows, such as was never obtained by any other means; only by the use of the now forgotten sulphocyanide of ammonium was anything like it ever obtained. The following is the formula for this process:—

Ammonium sulpho-cyanide ...	1 part
Water	15 parts

To this solution are added a few grains of a ·001 solution of chloride of gold, until the prints have the desired tone. When adding the gold the whole solution must be kept stirred, in order that the brown precipitate which is at first produced may be at once redissolved. This bath keeps well for a long time, and fixes the prints simultaneously. A bath of tungstate of gold also gives a beautiful purple tone, shading off into rose colour; in 3 litres of boiling water are dissolved 20 grams of sodium tungstate, to which is then added 1 gram of chloride gold that by slow evaporation has lost all free acid, and contains a little sub-chloride. This bath must be used only when cold.

Some years ago a German photographer who had settled in Italy wrote to me offering 100 francs for Disderi's formula for his gold bath, which also gave a purple tone, with rose colour in the more delicate shadows. Disderi, in his work on photography, has published several formulæ for the toning bath, but not one of them could produce the effect required. He seems to consider it imperative to use a chloride of sodium (common salt) bath, or at least the addition of this salt to the gold bath. The following is one of his formulas:—

Water...	1,000 grams
Sodium chloride	100 ,,

Pass the print quickly through this bath, and the lay it in the following:—

Water	1 litre
Calcium chloride	5 grams
Gold chloride	½ gram

So soon as it assumes a violet tint, take it out and lay it in a second gold bath (1 : 1000), when the tone assumes a bluish tinge; as a rule, it is then fixed. In my own opinion the second gold bath may be dispensed with by putting 1 gram instead of ½ half gram of chloride of gold in the first one.

◆

A VISIT TO THE MUSEE INDUSTRIELLE, BRUSSELS.

A Correspondent writes:

Photography is liberally dealt with by the State in Belgium, a splendid building being appropriated to a most complete laboratory, a lecture hall, and a scientific museum. In command of this institution is M. Rommelaere, who receives the English visitor with a hearty welcome. We were greatly indebted to a kind letter of introduction from Captain Abney, for, as M. Rommelaere advanced, cigarette in mouth, we were at once made to feel at home. What a collection is here to be seen of the best English lenses and cameras! No such instruments, our kindly host assured us, could be obtained for love or money from anywhere but England.

Every known form of lens was here, its qualities carefully registered. Not only photographic apparatus was there; every branch of science had its illustration in appropriate mechanical appliances. Complicated arrangements of levers and pulleys explained the action of various forces. Electrical and galvanic batteries and wires were all over the place. Air-pumps, portable furnaces, baths, and dishes of every kind, all in admirable order.

A burly Flemish attendant, at a word from his principal, compounded deftly, developing and other solutions, and brought them for use, disappearing anon into an adjoining laboratory, where he resumed the concoction of certain ill-smelling chemical preparations over gas fires.

M. Rommelaere had a class of ladies soon after our arrival, and delivered to them a brief but very interesting chemical lecture, illustrated with appropriate experiments; he had a most attentive audience, who made copious notes. During the summer a valuable course of photographic lectures of a practical nature is delivered, and full right is enjoyed by all to avail themselves of the opportunities for study afforded by this noble institution.

It will be surmised that the latest phases of English photography were well known at the Musée, and, in fact, dry plates of best English fabrication were in daily use, and the most delicate *nuances* of variation in results of pyrogallic or ferrous oxalate perfectly understood. Labours such as these give way, at twelve, to the Continental dejeuner, and at a hospitable restaurant hard by, a table is daily reserved, and here meet a delightful little company of scientific and literary celebrities. Accorded, by universal consent, the position of head, is the veteran chemist M. Stas, whose writings and researches on silver salts and combinations are so well known to English photographers. Here is found also daily, the Flemish poet, Hiel, and the Algerian traveller, De Kuypre, and several others of similar tastes. In little more than half-an-hour the little company separate to meet thus each day. It is a gratification to the Britisher to find one country, at all events, where England is thought well of, and not yet spoken of as being "effaced." Belgium has not only imitated our free institutions, but in some, gone ahead—notably, in this grand Musée Industrielle. M. Rommelaere is a great authority on salts and combinations of platinum and gold, and is now occupied in carrying out to completion some most interesting and abstruse investigation on these matters, at the expense of the Government. Not the least worthy of note has been the labours of M. Rommelaere in the Belgian Photographic Society, which he may be said to have created, and it is to his industry and indomitable energy that the fine exhibitions of photography have been held in Brussels. In that his success has been complete, for the society is composed of a very large number of the most eminent Belgian professional photographers and amateurs, under the genial presidency of M. Moutefiore. It needs but to add that the friendly greeting of M. Rommelaere, and his circle of able and excellent scientific friends, leaves the most pleasant feeling on the minds of all strangers who meet him.

There is another, and very different branch of science to photography, in which M. Rommelaere has a special reputation—that of metallurgy, and many of his preparations to illustrate different combinations of the rarer metals, such as are only produced in the very smallest quantities, are truly interesting. But gold and platinum are the two to which he has most largely devoted himself, and at the time of our visit he was completing a set of investigations that had extended over several months.

Among the minor matters our photographic friends very often do not sufficiently attend to are order and cleanliness in carrying out their different chemical operations (now, by the way, so much reduced in number); and those who think filters need not be very clean, or papers very carefully folded, would get a useful lesson by noting the punctilious cleanliness of all the chemical operations in this laboratory. Developers had that bright sparkling look which showed they were made of pure chemicals, and most carefully compounded.

Notes.

Pictures for the Pall Mall Exhibition must be sent in on the last day of next month.

A photographic society has been formed at Nantes.

They have been to law over the Lambertype patent in the United States. One would hardly have thought that a patent based upon the development of carbon prints upon collodionised glass would hold good, but so it seems. A Mr. Lilienthal is declared its owner, and Mr. W. W. Washburn has been ordered to account for any profits made by infringing the patent.

Our esteemed Paris correspondent, M. Léon Vidal sends us his new book on Woodburytype, or *Traité Pratique de Photoglyptie*, as its proper title is. It is certainly high time we had a book on the subject, and M. Vidal's manual, describing the old process and the new, fulfils its purpose admirably. We shall refer to it again shortly.

Mr. Henderson's interesting paper on the comparative cost of collodion and gelatine will set many thinking. We wish he had added a third item, and made comparison also with home-made emulsion ; the difference of cost, though still, of course, in favour of gelatine, would have been much less marked. Take Dr. Eder's simple plan of emulsion making, for instance, which we cited first in our Year-Book, since we found it one of the best and surest modes of preparation. The labour involved in producing a batch of emulsion by this method only amounts to two or three hours' actual work, and is not much more than that of making a silver bath, keeping it in order, cleaning and coating collodion plates, &c.

As Dr. Eder's formula stands in the Year-Book, the cost of materials may be put at eightpence, and the emulsion resulting is enough to coat two dozen and a quarter of quarter-plates. Let us say that only two dozen plates can be coated, and that the cost of this amount of glass is another eightpence ; we arrive at the fact, then, that anyone who has the skill and patience to do so can prepare gelatine quarter-plates at eightpence a dozen. This sum is but $\frac{4}{11}$ that cited by Mr. Henderson as the cost of purchased gelatine plates, and we must therefore reduce his total from £12 to £4 10s. ; in these circumstances there would be but a difference of a sovereign in favour of collodion during a month's work. Still there remains a feature, which Mr. Henderson has pointed out, that photographers are more prodigal with their gelatine plates than with collodion.

On the other hand, the photographer who buys his plates effects a saving in another direction. He does not want an assistant operator to coat and bath plates continually. "I have been able to do without a second assistant since working gelatine plates," Mr. Midwinter, of Bristol, told us ; and there are many others who have done the same.

The Queen has been pleased to appoint Mr. W. H. Christie, the principal assistant at Greenwich Observatory, to be Astronomer-Royal in place of Sir G. Airy. We mentioned the likelihood of this appointment some weeks ago.

The salary of the Astronomer-Royal is a thousand a-year with a residence ; but Sir G. Airy, during the last years of his appointment, received a special sum of fifteen hundred. Altogether, Government pays for science far more liberally than was the case twenty years ago, when a scientific man, even of the first rank, enjoyed but the salary of a junior clerk.

Among the best scientific appointments under Government of the present day, may be reckoned the inspectorship of fisheries, held by Prof. Huxley (£1,200) ; the directorship of geology (£1,100), held by Prof. Ramsay ; the post of chemist to the War Office, held by Prof. Abel (£1,000) ; that of principal of the Inland Revenue laboratory, and the inspectorships of minerals and alkalies (£900) ; the keepers of scientific sections at the British Museum, as also the chemist of the Mint, receive £650 per annum.

The latest penny novelty now on sale by street vendors in the City is a set of cast iron skeleton letters half an inch high, and neatly attached to a well-printed card.

This is not all ; for the letters are electro-coated with a thickish layer of copper. Who, taking a ten-year-ago view of things, would have thought it possible to sell twenty-seven neatly finished iron castings, all different, and electrotyped over, for one penny ?

A business man tells us that the manufacturer of a penny article must put it into the market at less than six shillings a gross, or under half price.

The cast-iron alphabets may be expected to soon appear in most of the novelty shops of the country, as the manufacture of them is evidently a tolerably large venture. Our photographic friends can make numerous uses of these letters in connection with their work. They may be attached to card or glass with varnish, or soldered to metal, the electro coating of copper rendering this latter operation easy ; and, being mere skeletons, either side may be placed upwards.

Some years ago a maker of door plates used to sit at a street stall near the Morgue, in Paris, and all work was ready the day after being ordered. The plates were neatly cast in type-metal, and the name stood up in high relief, the price for one about 4½ inches long being half a franc. A few sets of the skeleton letters and a toy stereotype foundry at 7s. 6d. would now serve to set one up in this business.

Dr. Koch's recent discoveries made by the aid of the micro-camera were brought prominently forward last week at the International Medical Congress by Professor Klebs and Mr. Lister. Dr. Koch's method of demonstrating by photography the presence of bacteria in animal tissue which are invisible to the eye—a fact that goes far to prove that certain animalculæ are inherent to certain diseases—had been before our readers for some time past.

Topics of the Day.

AFTER-TREATMENT OF GELATINE NEGATIVES.

BY GEORGE CROUGHTON.

I hope you will permit me to say a few words on this matter, which recently formed the subject of an essay in your columns. I have given up my first practice of retouching first, and varnishing after, for a plan I have now used successfully for many years. I employ a special retouching varnish, and work with a blacklead pencil upon that; still there are some advantages in retouching upon the gelatine film where the negative requires it, but with the plates I am now using I find it preferable to varnish before retouching.

With Swan's plates, or any other where iodide as well as bromide is used, the film will bear a deal of rubbing, and with Swan's plates I have gone so far as to roughen the surface with cuttle fish powder; but, speaking from experience, I should only recommend such retouching as transparent spots, or the very heaviest shades in an under-exposed negative being done upon the negative before varnishing, with the exception of view negatives, to which the gelatine lends itself with the production of the most charming effects. As a rule, a gelatine negative gives a sky which prints an even tint of grey, not white skies, as the majority of collodion negatives. I have one before me now, instantaneous, a view upon Lake Lothing, two boats and a figure in the foreground, the lake with reflections of the ferry, hotel, and trees, and several yachts under sail. Now some parts of the sails print the same tint as the sky, and where two yachts are close together the sails are too much the same tint. Place the negative upon the retouching desk, unvarnished, but quite dry. The materials required are several sable pencils, from No. 0 to 4, blacklead in fine powders, and the usual HB-B and BB retouching pencils (I use Rowney's ever-pointed), and after breathing gently upon the plate, put in the general form of masses of cloud, rubbing the powder into the gelatine film with a firm rubbing movement.* You will find the gelatine take the powder splendidly, and any gradation can be obtained, and any amount of lead can be put on by breathing before each application; of course you want to put in your clouds with judgment to pull the picture together, and keeping the light and shade according to the light and shade upon the landscape. Having worked in the cloud, and graduated the sky towards the horizon, we next turn our attention to the sails of the yacht nearest us, carefully noting the light and shade upon it, begin to pile up the lead upon the highest light, and graduating it into the shadows, as you can by this method, by imperceptible gradations. A touch sharp and decisive at the bow of the further yacht, where she is cutting the water (this being done with the BB pencil) will separate the hulls. Now touch up the reflections of the white sail in the water; this brings us to the boats and figure in the foreground. With firm touches of the HB and B pencils, strengthen the lights upon the gunwale of the boat, the oar in the man's hand, the collar, and those parts of the face which are in direct light. The negative can be varnished in the ordinary way, and the retouching is safe. The effect when printed is striking; what was before a soft grey picture, with a limited scale of tones, is no less soft but with brilliancy and artistic effect, which repay for all the time and trouble expended upon it. It will be seen that the use of the powdered lead may be resorted to for portraiture for lightening the background behind the sitter; for putting in artistic light and shade upon a flat background; for giving forte points upon white draperies, and numerous other dodges which will suggest themselves to any practical man. When all this has been done, varnish with Hubbard's retouching varnish, or good white hard varnish, thinned with twice its bulk of methylated spirit, and one drachm of castor oil added to each pint of varnish. If you prefer to retouch upon the gelatine, and preserve the retouching by varnishing after, you cannot do better than use the Autotype medium upon the gelatine film direct, and when retouched, varnish with Autotype varnish; but whether varnished first or after, the manipulations of retouching are the same.

The lead mostly used in my practice is the H, brought to a long fine point upon glass paper No. 0; of course it is supposed you have a retouching desk with a fine ground screen behind the negative, and the reflector, which can either be silvered glass or a piece of white cardboard. Cover up all but the face with a mask of brown paper, and we are ready to commence.

Good gelatine negatives require much less retouching than collodion negatives, but the work required is more difficult; the gradations are so delicate, and the negative so thin, that a much lighter touch is required, and greater care not to overlap the part worked upon. For instance, in filling up freckles, great care is required that the point of the pencil does not travel out of the particular freckle which you want to work up to the surrounding parts, for if you let the pencil overlap, a gritty effect is produced. My practice is still, as it always has been, to make good photographic defects without showing marks of labour, not to give the effect of an elaborate stipple all over the face. To retouch in this manner, we must first know what those defects are; they depend upon the colour, upon the face of the sitter, and upon bad lighting; for instance, too strong a top-light will exaggerate the shadows under the eyebrows, will give too great prominence to the cheek bones, and often cause an appearance of hollowness, which does not really exist, to the cheeks, will give too much shadow under the nose and chin, and make the upper lip too heavy. This causes work which the retoucher should not have to do. Under-exposure will produce the same effects, and the only thing to do is to try and lighten those shadows by working from the lights into them; this will require great care and great labour, for working upon what is nearly bare glass is a most difficult job, and must be done both lightly and evenly. The ordinary defects with a well-exposed, properly-lighted negative would be little breaks in the gradations, caused by the yellow spots which are to be seen even in the fairest complexions; breaks or irregularities upon nose and cheeks, caused by freckles; an appearance of heavy shadow under the eyes, caused by the purple shade which is so marked in some sitters; and an appearance of hollowness to the cheek where there is a good colour upon them. My method of working is to commence upon the highest lights, using a light circular rubbing touch, strengthening the lights where needed first; and then working from them into the shadows, mending every irregularity or break as I come to it, blending it with the gradations of the shadow, lightening the deepest shades if needed. The greatest difficulty a beginner has to contend with is a tendency to work out and even up every little shade or demi-tint which comes in his way, and so destroy both likeness and anatomy. Upon the forehead great care is needed to keep the delicate shades which give character to the head; if the shadow upon the edge of the forehead and cheek (on the lighted side) of the head be worked away, the face is made broader and the shape altered; and should the light shade in the centre of the forehead be worked up to the surrounding parts, a square massive forehead full of characteris made round, smooth, and characterless. Great care and observation are also wanted in dealing with the nose; carefully preserve the shape of the hightest lights, and do not be tempted into the greatest of abominations—a straight line of light down every nose, whether Roman, aquiline, or pug. A great deal can be done with the mouth to improve the expression, without altering the likeness. All lines downwards from the corner should be softened, and sometimes can be removed with advantage. Remember that a downward curl to the corner of the mouth gives a sad expression, while an upward curl will give a pleasant one. The shades round the chin go far to make up the character of the face, and should be carefully preserved. A deal of the roughness seen round the chin and upon the necks of elderly persons can with advantage be softened, but not entirely removed. The same may be said of lines and wrinkles upon the forehead and round the eyes; no one likes those lines exaggerated, at the same time there is nothing so untrue and ridiculous as to see an elderly person with a forehead worked as smooth as a billiard ball. Another delicate shadow which is most essential to the character of the face is that which, beginning from the ear just under the cheek bone, runs through the cheek and meets the shadow from the nose, which gives the roundness to the cheek; this shadow, if filled up, gives that puffiness to the face which is a characteristic of a great deal of the cheap retouched work, done, as it mostly is, by those who have no knowledge of either anatomy or drawing. Till taught by experience and observation it is better for the beginner to do too little rather than too much to soften and mend; but remove nothing. Be sure that in a well-lighted, properly-exposed negative there is no shade or tone upon the face that can be entirely removed without danger to the likeness.

---

* This is done by rubbing one of the sable pencils into the powdered lead and transferring it to the negative.

The "Topic" next week will be "Reception Room Notes; on Receiving the Sitter and Taking an Order," by Mrs. H. M. Way and "S. A. J."

THE RELATION OF PHOTOGRAPHERS TO THE PUBLIC, AND THE PUBLIC TO PHOTOGRAPHERS.

BY H. ROCHER.*

These relations I consider, and always have considered, to be purely mutual, from an artistic standpoint, as well as from the business standpoint; and, as we all have to live on and by what we do, the latter standpoint is the one a little stronger appealing to our consideration. In regard to the former, the artistic standpoint, I take it as granted that every one of us works as conscientiously and carefully as his abilities will admit him to do; but regarding the latter, why do we hear so many complain about, I will not exactly say bad business, but of low prices? Do not low prices in almost every locality predominate? And is it a stimulant for earnest workers in our vocation to go on and offer to the public continually the fruits of their brains and talents at sham prices? Where do you think this will lead to? This leads unavoidably to self-degradation: and this brings me to the very point in which I would say the relations of the photographer to the public are misunderstood. You have lost your self-respect, and the public mean to do with you as they please, and not as you should do; for in your house and business your rules must stand, and you must abide by them, or you must bear the consequences—fall, and so lose the so very necessary respect of the community.

The words, "guard your dignity!" have so often been printed in our photographic journals—words full of good, very good advice. This is another point where the relation of the photographer to the public is seriously implied; but how many have heeded this advice? If you wish to be respected, make the public respect you for everything you say, do, or they see about you. Be firm in what you transact with your patrons. If you say "Yes," be it yes, and if "No," be it no; in short, have strict rules for the transaction of your business, and adhere to them without faltering. It may be, in the beginning, a little difficult to introduce a little more exacting regulations in business, but you must try it; for without having tried a thing, you cannot fairly speak on its merits. A correspondent in a late number of a photographic journal said about the speaker, meaning myself, "R. is the only one in the city who treats his customers perfectly independent, and makes them pay high prices." This is, in fact, the case; he did not say too much; but you must not make the reply that "whatever I do, you cannot very well do in your business." Yes, you can, if you only want to; and everybody, every photographer, can and should do it, and, if you will only try it, you will soon feel the good results. Do not misunderstand the words of that correspondent when he says, "he treats his customers perfectly independent;" they sound worse than they are meant; they simply mean: I am firm, and deviate not from my rules or prices; and if, in a very few instances, objections were made, we would politely tell the visitor that we would rather decline to work than to do his bidding; this generally settles the case in our favour.

Now, if such rules were to be introduced more energetically in the photographic business, there would be far less complaints on the part of the photographers of losing the esteem of their patrons; for you will probably all admit that a man that stands boldly up for his principles stands a better chance to gain respect and confidence with his patrons than one who totters and trembles for fear of losing a dollar, and for that sake gives way to making all kinds of concessions.

At the conclusion of this little essay, I wish to touch upon the so-much complained-of nuisance, the resitting of persons. We all know that we are liable to fail sometimes, but failures should be carefully avoided, and a sitter only dismissed when you know and are convinced you have secured the best possible result. With this conviction as a base of action, be firm in according to your patrons what your stipulated rules, if you have such, grant him in the way of a resitting, and no more; for if, as in some instances which I could here relate, an almost endless number of sittings is given, the latter would, for caprice sake, soon become the rule of the day, and you might well look out for time to give a new-comer his first sitting. From a financial standpoint, this is the greatest nuisance photographers have to battle against; and you should adopt rules which will guard against this evil.

As I presume that the regulations and rules which I have laid down for the conducting of my business are sufficiently known, I defer from repeating them here. Suffice it to say that they stand for the last twelve years unaltered, and the number of resittings, of which I keep a correct account, amount to no more than from three to five per cent.

MEASURING DURATION OF EXPOSURE BY SHUTTERS.

BY A. HADDON.*

What I wish to bring under notice is an attachment to certain rapid shutters by means of which the duration of the action of light on the sensitive plate can be recorded. In many cases it would be very desirable to know the exact time the exposure lasted, so as to be able, on some future occasion, to vary it in some known ratio, or, if necessary, to exactly reproduce it. Up to the present, as far as I am aware, no shutter can record the time occupied by the aperture in passing in front of the lens.

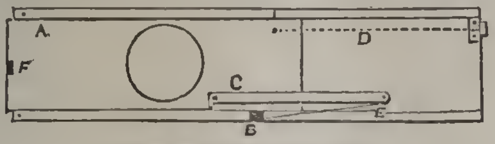
I was told a short time back, that a certain photographer, who has been very successful in depicting objects in rapid motion, obtains an idea of the exposure by tying to the end of a piece of string, a stone covered with white paper, then causing this to whirl round at a distance from the camera at a given rate. While this is going on, a second person exposes another plate. Knowing the length of the string, the distance traversed by the stone as marked by the impression on the plate, and the time necessary for one complete revolution of the stone, the necessary data are at once got for obtaining the duration of exposure. Now this method, to say the least of it, is expensive, and limits one very much to the number of plates that can be exposed in a given time, especially if the exposures are not all the same.

---

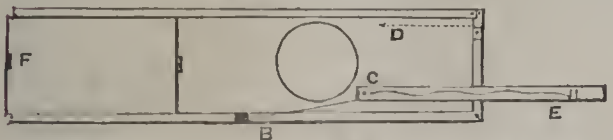
* *Philadelphia Photographer.*

* A communication at the Thursday Evenings.

The method I propose is to cause the moving shutter to push aside a vibrating prong, to the end of which is attached a bristle or other suitable style; the prong when released carries the style over a smooth surface, on which has been smeared some easily detached powder; then, by knowing the rate of vibration of the prong, and the number of complete waves marked on the surface, we have at once the duration of the exposure. If we find that on a particular day we gave, say, $\frac{1}{20}$ of a second, and to-day the light, by trial, is only ½ as actinic as it was on that day, we can easily adjust the spring which gives motion to the shutter, till we have doubled the number of complete waves depicted, and so doubled the exposure; if, on the contrary, the light is twice as actinic, we can use a stop, and still use the same length of exposure. I do not wish it to be understood that I advocate this form of shutter or any other; all that I wish to draw attention to is the method by which the shutter is made to register the duration of the action of light.



Shutter set ready for exposing.



Shutter after exposure, showing wave line made by the style.

A, slide of shutter.
B, reverbrating prong kept back by small pillar E.
C, brass plate smeared with lamp black and spirit.
D, spring of shutter.
E, trigger to release shutter.

Some people will most probably object to the spring, in consequence of its vibrating, and so communicating motion to the camera; but the masses are so very different, that I think this would not be felt.

I am not aware that this form of register has been applied to any every-day shutter; if it has, I must ask pardon for having taken up time with this subject.

◆

LUX E TENEBRIS.

BY PHOTO-CHEMICUS.

Many months ago, in a paper in the Photographic News, I stated that I had considerable doubt whether the extreme non-actinic light prescribed as indispensably necessary for gelatine plates is absolutely essential. I *doubted* it then, but I *dispute* it now.

I have lately developed several plates in my dark room with only one thickness of yellow glass. I commenced by experimenting after seven in the evening, but since then have developed several in the middle of the day without the slightest injury from fog. I lately drew the attention of a professional photographer to this fact. At first he ridiculed it as a rank heresy, but on persuading him to try the experiment he was much pleased with the result, which gave him so much more light in which to operate. It is true that on holding one of his plates close up to the yellow glass of his dark-room, unmistakable fog commenced to radiate from one corner, but by removing the plate at once it stopped, and he saved the portrait. This was rather an unfair test, and I willingly admit that gelatine plates are much more sensitive to yellow light than collodion, but am quite satisfied that much more light may be admitted to the dark-room than is generally believed compatible with safety, and I think that if your readers will try it they will come to the same conclusion as myself.

ODDS AND ENDS FROM THE ANTIPODES.

BY J. J. CHIDLEY, OF MELBOURNE.

Perpetually New Negative Baths.—I have for very many years been in the habit of turning my old negative baths into printing baths in the following manner. Measure the quantity of bath, and add to every ten ounces from one to three drachms of nitrate or silver, so as to bring up the strength to 40 grains, 1 ounce of nitrate of ammonia, ½ drachm liquid ammonia, and 1½ ounce of methylated alcohol. The bath having nitrate of baryta in it is no disadvantage, but there must be no acetic acid in it, only nitric acid. Float three-quarters of a minute in summer, one minute in winter, and it never discolours. I prefer it to one made from new materials.

A Steel Punch for Cutting Albumenized Paper for Cartes-de-Visite.—I have been using for some time past a square steel punch with round corners for cutting out albumenized paper for cartes-de-visite; it can be used with any ordinary copying press; fifty or sixty can be cut at a time; a section of a block of any hard wood forms the best bed to cut upon.

Adding Intensity to any Portion of a Varnished Negative.—It may sometimes occur that a hand or some portion of a negative may print darker than is required. Any increased intensity can be obtained by evenly colouring the part with a small brush dipped in Judson's orange dye mixed with about two-thirds of gum-water; it can be used on the collodion side, as it can be removed by water. Being perfectly transparent, it blocks out no detail.

Removing Small Black Spots from a Finished Proof.—It sometimes occurs that a small spot in the negative has been forgotten to be stopped out; it can easily be removed from the printed proof by means of the point of a fine needle. A good magnifying-glass is sometimes necessary.

A Good Mode of rendering the Surface of any Varnished Negative fit to Retouch upon.—Get a sheet of No. 0 emery cloth, rub the top of the finger on it, then rub the portion of the negative with the top of the finger; a suitable surface will be made immediately for working on with lead pencil. Should any of the emery stick to the varnish, moisten the top of the finger and rub it off. Any pencil-marks not required can be rubbed out with the point of a small piece of deal wood moistened with the saliva.

Formula for a Quick Collodion.

Plain collodion	1 ounce
Iodide of cadmium	3½ grains
Bromide of potassium	2½ grains

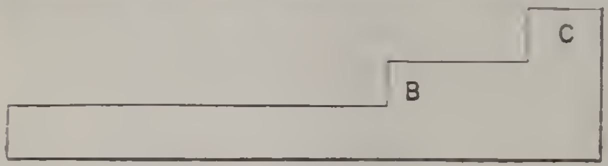
The bromide of potassium should be pounded fine, and dissolved in a few drops of distilled water, and poured into the collodion. After the cadmium is dissolved, on shaking up the collodion, the sediment settles down in a few hours, and it assumes a pale straw colour; it is then ready for use, and keeps very well. It is especially suitable for light dresses, strong contrasts, instantaneous negatives, &c. Having used it for many years, I can strongly recommend it.

An Easy Mode of Making a Glass Dipper for a Negative Bath.—Take a small hand-saw, file and grind the point down fine on a sheet of No. 1 emery cloth, cut a piece of glass of the required size, keep the point of the file moist with the saliva, press it lightly on one of the lower corners of the glass, and turn it quickly; it will soon make a hole through the glass. Commencing on each side of the glass, and meeting in the middle, renders it less liable to break. Another hole must now be made in the opposite lower corner. Cut a small piece of a lucifer match, and press tight in each of the holes; it makes no wave on the negative, like the ordinary dipper.

The Uses of a Lens.—I believe there are many photographers who do not know in how many ways they can use a No. 1B Dallmeyer's portrait lens. I have never possessed a view lens, but constantly use the front combination of a No. 1B Dallmeyer's lens, removing the back combination and screwing the front in its place. With the

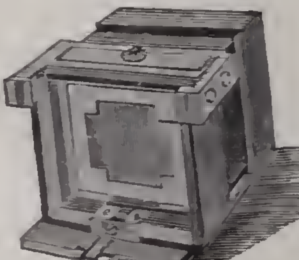
No. 5 or 6 stop, a very good half or whole view can be taken. A good 10 by 8 view can also be taken with the back combination, using a stop with a hole not more than $\frac{1}{8}$ of an inch in diameter; this can be made of cardboard, or thin sheet zinc.

A Handy Addition to any Camera to hold the Focussing Screen when not in use.—For a $\frac{1}{4}$-plate camera take two pieces of wood about four inches long, one and a quarter broad, and one inch thick; saw them as drawn below, and screw them across the top of the sliding body of the camera, so that the part marked B fits close to the top corner. The focussing screen can be slid down between the parts marked B. When it is necessary to put the dark slide in place of the focussing screen, it will then be handy to replace. A screw should be carefully put through the portion marked C, to increase the strength.



A Mode of Reducing Over-printed Proofs.—After having toned and fixed the prints, taking care not to overtone them, but rather the reverse, immerse each over-printed proof direct from the fixing bath into a dish of water to which has been added about a dram of a cyanide fixing bath (if it has been in use for some time, all the better); only a few prints should be immersed at a time, and constantly watched, and returned to the hyposulphite fixing bath for a few minutes. Directly they are sufficiently reduced, they should take one or two minutes to reduce, or the colour is injured. In this case the solution is too strong, and must, therefore, be diluted.

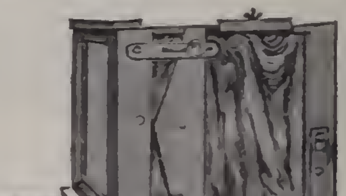
How to Fit a Screw to Move the Sliding Body of a $\frac{1}{4}$-Plate Camera at a cost of One Shilling.—Get from any ironmonger a brass head shutter bolt about 5 inches long with the brass nut, plate and screws, then have a $\frac{1}{8}$-inch hole drilled through the centre of the bolt as near the head as will keep it turning freely in the plate, and serve to retain it there by rivetting a pin in the hole. Now saw out a slot in the bed of the camera of the length of the bolt, and sufficiently wide to allow the nut to move freely backwards and forwards when screwed to the sliding body; fasten the bolt in the slot by screwing the plate on the front of the bed of the camera; now cut off one-half of the nut with the edge of a three-corner file, and fasten it to the sliding body by screwing it to a small piece of wood screwed down to the centre in front of the focussing screen as shown in drawing.



By turning the head of the bolt you can move the sliding body backwards and forwards as required. I have used for many years three cameras of different sizes fitted this way, and prefer it to any other method of moving the sliding body of a camera.

A Method of making a Perfect Register between the Focussing Screen and Dark Slide.—To make the guage: Take a perfectly flat piece of wood about $1\frac{1}{2}$ inches broad, $\frac{3}{4}$ thick, and from 1 to 2 feet long, according to the size of the camera; put a long thin screw through the centre; allow the point to protrude about $\frac{3}{8}$ of an inch from the under surface. Take the dark slide and place a spoilt unvarnished negative in it, close the back, and draw up the slide: place the guage across the opening, and adjust the screw until the point touches the negative: move the guage about, and you will soon see if the slide is perfectly level by the screw-point touching the glass all over evenly. Then take the guage and lay across the inside surface of the focussing screen; if the point of the screw touches all over the surface of the ground glass, the register of course is perfect; but if not, it proves that the ground glass should be fixed nearer the surface. To do this, remove the strips of wood from the outside surface, and in their place fix at each corner firmly to the side a small piece of wood: then, by means of a screw which is placed on the centre of each, you can adjust the glass as you wish.

How to make a Swing-back to a 12 by 12 Camera at a cost of 2s. 6d. or less when made by yourself.—Take the sliding portion of the camera and saw off a two and a-half inch section of that part nearest the focussing screen; strengthen this by four small brass or hoop-iron brackets screwed on the outside corners, then saw off the remaining portion of the sliding body four corners to bring it to the angle required, taking care that the centre of the angle should be three-fourths of an inch farther from the bottom than the top, so as to allow room for the swing-back to move without coming in contact with the bed of the camera. For the hinges, take two straight flat pieces of hoop-iron or thick sheet brass about three and a-half inches long and about one inch wide, punch and countersink three holes at equal distances; fasten them inside at the centre of the angle by two screws through each; suspend the section holding the focussing screen at the centre of the angle by a short bolt or stout screw. Cut two pieces of sheepskin leather sufficiently large to cover the open space between the section and the angle, and tack them closely all round the inside, so as to perfectly exclude the light. To retain the swing-back at any angle required, take a piece of thick hoop-iron six inches long, punch a hole three-eighths of an inch from one end, cut out of the centre a quarter-inch wide slot, three and a-half inches long, extending to within half-inch of the other end; fasten it to the centre of the top of the section holding the focussing-screen by a stout screw through the hole. I pass a short bolt from the top of the inside of the angular portion through the slot. A milled-edged nut tightening on the hoop-iron will hold the swing back firmly at any angle required. See drawing.



A very handy Addition to any common Quarter-plate Printing-frame.—Get a square of common 16-ounce ground glass, and cut it into strips about five-eighths of an inch wide; take a printing frame, and with a pocket-knife cut off a small strip of the thin edge of the two blocks, at either or both ends at the backs; cut it slightly inward; measure the space between, and cut off a piece of one of the slips of glass of the same length, only rather full, press it firmly and evenly up between the blocks; the sharp cut edge of the glass will make its own way, and remain firmly bedded in the frame, the ground side outside. The printer can make a stroke with a lead pencil for every print until the order is complete, and wipe it out ready for the next negative.

Correspondence.

GELATINO-CHLORIDE.

Sir,—As is my usual luck, there are several rather absurd errors in my letter published last week, and sometimes I am made to write nonsense indeed. At the third line from the bottom of column, page 370, for "plate" read "state." In the next page, in the middle of the column, for "amenity" read "amenability"; and a few lines lower down, "or retarding" should be inserted in the bracket before "for." In the next paragraph but one, for "this action" read "the action;" and for "central" read "general."

I observe that Captain Abney now testifies to the high general sensitiveness of silver chloride, and thus it appears that I was not far out in my estimate of the characteristics of silver chloride, both as regards sensitiveness to special rays, and as to general sensitiveness in the camera, as Dr. Eder would have had your readers believe, or rather, I should say, would have caused them to believe. Either Dr. Eder has not been so successful in the direction of general sensitiveness as Captain Abney has been; or, otherwise, his bromide must be of a "double million" order of sensitiveness indeed! Captain Abney finds silver chloride very considerably quicker than a wet plate, and I have no doubt that this is the case, as my old preparations in a good light might almost compare with wet collodion. Captain Abney seems likely to advance gelatino-chloride into the position of a negative process. Dr. Eder sees nothing in it but a means of producing positive pictures.

I notice Captain Abney mentions a "fair dose of some soluble chloride." I had thought of observing during the late controversy in your columns upon the use of silver chloride in bromide emulsion, when Dr. Eder stated that soluble bromide would be necessary to convert the chloride into bromide, that I had found it possible to use a large dose of soluble chloride as a restrainer during development of plates containing chloride alone.

Now, should any wonder at my taking this matter up as I have done, I do not mind owning that I am pleased to find that I am *not wrong, but right* in my conclusions formed when none but myself took interest in the subject.

Mr. Spiller asks whether anyone has developed gelatine plates successfully a year after exposure in the camera. Well, I have not done so, but I have just secured negatives from some of Wratten and Wainwright's plates exposed on the 29th of October last. These plates, I understand, contain iodide of silver. They were kept several months in the slides. I doubt whether any collodion dry plate would stand this treatment, as with collodion dry plates a line is generally formed, either opaque or transparent, opposite the slit where the shutter hinges, and which makes its appearance on development.—I am, sir, yours faithfully,
Herbert B. Berkeley.

COLLODION V. GELATINE.

Sir,—Being a little surprised at Mr. Henderson's statement in connection with the above, and seeing the conclusion he arrived at tally very badly on the side of gelatine plates, let us view comparative prices from another standpoint, bearing in mind that the emulsion is to be made and the plates coated and dried in the same dark room where the collodion plates were coated. Take Mr. Henderson's own figures to be correct with collodion (£2 9s. 1d.), including developer, for 128 dozen quarter-plates.

Now it is well known that gelatine plates can be made to give undoubted satisfaction, therefore it is requisite that dry-plate workers who make their own should give their impartial opinion in the matter, so that an accurate statement of expense may be arrived at.

Take one ounce of nitrate of silver with the well-known quantities of gelatine and bromide, and you will have twenty-six ounces of emulsion, which will coat fully twelve dozen quarter-plates at the expense of 4s., not including labour or glass, as neither is included with the collodion plates in question, which amount, for 128 dozen quarter-plates, is £2 2s. 8d.; Mr. Henderson's developer, 11s. 1d.; total, £2 13s. 9d.; which makes a difference in money of 4s. 8d. in favour of collodion.

It is absolutely necessary that if you introduce a manufacturer with all the necessary expenses of selling in the one case, you must also do so in the other, to arrive at a fair balance between the two; and, as a dry-plate maker and worker, I therefore write from practical experience.
P. F. Patrick.

Sir,—One story is good until the other is told, and as my experience with dry plates is so different to Mr. Henderson's, I felt that I could not let it pass unnoticed. Mr. Henderson wants to paint the gelatine black, or he would put silver at more than 3s. 1d. per ounce, and I never could get good quarter-plates under 9s. per gross, so that, taking quantities from Mr. Henderson, I make it—

Silver, 6¾ ounces at 3s. 6d.	£1	3	7
Collodion	1	6	0
Developer, &c.	0	2	3
1,535 plates, at 9s.	4	16	6
Cleaning same	0	10	0
Coating	0	10	0
Total	8	8	4
Cost of 1,535 gelatine plates at 20s. per gross	10	15	0
Developers, &c.	0	6	0
Total	11	1	0
I develop two plates at a time, with 2 grains pyrogallic	8	8	4
Balance for collodion	2	12	8

As to the value in pleasure, using, and saving of time (which is money), anyone who has used the gelatine plates constantly must acknowledge that the pleasure and comfort of the one is far before the other; but if Mr. Henderson is using both processes, I can quite understand the opinion he gives. I have used dry plates constantly for eighteen months, and would not give them up on any account; but to work them successfully you must give your mind to them. As to money value, I could not have got through my work this summer without an assistant at (say) 30s. per week, and I am sure that I have earned pounds by taking children, groups, &c., in such weather as I could not have thought of in collodion days. As to quality of my work, it is better.

Trusting that some of your readers who have not already done so may be induced to try dry plates,—I am, sir, yours,
One of the Abominations.

Proceedings of Societies.

Thursday Evenings for Photographers.

At the meeting held Thursday, August 4th, Mr. A. Haddon, Royal Naval College, in the chair,

Mr. Cobb exhibited some negatives taken with one of Hunter and Sand's shutters from the window of a railway carriage travelling at about thirty miles an hour.

A report of the Balloon Society's garden party at Lillie Bridge was read by Mr. Cutchey.

Mr Cobb passed round some prints from negatives of the balloon, &c., and explained that he did not go up because the hour was so late, and the weather so rough, that there would not have been the least chance of his being successful

Mr. Le Fevre announced that the Society hoped soon to have another ascent, when he hoped that circumstances would be more favourable to Mr. Cobb.

The Chairman then read a paper on "A Method of Measuring the Duration of the Exposure given by certain Shutters" (see page 380). At the close of his paper he explained that, as he had only that evening finished his model, he had not yet been able to use it in actual practice.

Mr. Brown thought a tuning fork would be an improvement to the single prong.

Mr. Haddon said that the objection to that would be that so much greater power would be required to move it.

Mr. Debenham suggested using an harmonium reed instead of the steel prong, and also that the plate to receive the register should be made of glass.

Mr. Cowan passed round some negatives intensified by Dr. Monckhoven's formula.

Mr. Henderson had been using this formula for some weeks past, and found he could obtain plenty of density by its use; but that, after a time, the negatives in parts turn a ruby colour.

Mr. Debenham thought the discolouration was due to the plates having been taken from the hyposulphite bath too soon. He found that if the plate is immersed in the hyposulphite twice the time that is apparently necessary to fix it, a mercurial intensifier can be used with safety.

By request, Mr. Cowan gave the formula he uses:—

No. 1.—	Water	1 ounce
	Bichloride of mercury	10 grains
	Bromide of potassium	10 ,,
No. 2.—	Water	1 ounce
	Cyanide of potassium (crystals) ...	10 grains
	Nitrate of silver	10 ,,

Mr Henderson gave the following method of intensifying, which he found to work well:—First bleach the negative with bichloride of mercury, wash, and then apply lime-water; it gives a chestnut brown deposit.

Mr. Cobb said he had noticed that a negative exposed to light between developing and fixing, took a much longer time to fix.

Newcastle-on-Tyne and Northern Counties Photographic Association.

The third out-door excursion took place on Bank Holiday, August 1st. The members proceeded to Hexham by 10·15 train; and were met at the railway station by Mr. Gibson, who acted as leader for the day.

The old Abbey Church was first visited, the antiquarian and architectural features being pointed out and explained by the leader. The members were then conducted to Mr. Gibson's residence, where they were entertained to luncheon. They afterwards proceeded on foot to Linold's Bridge and the Devilswater, the cameras and other requisites being sent forward in Mr. Gibson's carriage. Arrived at Linold's Bridge, the members soon brought their photographic apparatus into operation, and a number of dry plates were exposed, the light being everything that could be desired.

Photography ended, the cameras were repacked and conveyed to Hexham in the carriage, the members walking to the White Hart Hotel, where they sat down to a capital "high" tea.

An adjournment was made after tea to Mr. Gibson's laboratory, and the party were favoured with an inspection of that gentleman's collection of negatives and prints.

The members are greatly indebted to Mr. Gibson for his hospitality and the very great trouble he took to make the excursion thoroughly successful.

Talk in the Studio.

South London Photographic Society.—The second out-door meeting of this Society will be held on Saturday, August 20th, at the "Greyhound," Dulwich. A meat tea will be served at 6 p.m. for the members and friends.

Edinburgh Photographic Society.—The Duke of Edinburgh has consented to become the patron of the Edinburgh Photographic Society, as appears from the following letter:—

"Dochfour, Inverness, August 2, 1881.

"Gentlemen,—I am desired by his Royal Highness the Duke of Edinburgh to inform you that he has much pleasure in complying with the request that he should become patron of the Edinburgh Photographic Society.—I am, gentlemen, your most obedient servant, W. J. Colville.

"John Lessels, Esq., F.R.S.S.A.
"W. Ranken, Esq.
"Malcolm G. Dobbie, Esq., Hon. Sec."

A Nice Group.—A few days ago, as Herr Schweitzer, the principal photographer of Strasburg, was arranging his atelier in the expectation of custom, the door was thrown open, and an exceedingly handsome young lady appeared on the threshold. Schweitzer at once recognised his visitor as "Miss Mina," the golden-haired, blue-eyed, "Lion Queen," of a travelling menagerie, temporarily established on a plot of waste ground outside the Metzger Thor. "I want to have my portrait taken," said the fair damsel. "I am at your service; pray be seated," replied the photographer, with a deferential bow. "By your leave," she rejoined, transfixing him with a steely glance, "I am not alone. Two friends are awaiting me outside your door.' So saying, she set a silver whistle to her lips and blew it shrilly; whereupon two stately lions stalked into the apartment, greeting its proprietor with a salutation of growls that made his blood run cold. At a sign from their youthful mistress, however, the formidable beasts sate down quietly enough; and Herr Schweitzer, gaining confidence from their peaceable demeanour, proceeded to "group" his appalling clients with trembling hands, placing Miss Mina on a sofa in a semi-reclining attitude, with a lion on either side of her. All three preserved a statuesque immobility during the exposure, the result of which was a remarkably fine picture, now adorning the windows of the leading stationer's shop near the Cathedral. Hundreds of copies have already been sold, and Herr Schweitzer's mauvais quart d'heure with a couple of loose lions is likely to prove the most remunerative period of his professional career.—*Daily Telegraph.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ Reception Room Notes; on Receiving the Sitter and Taking an Order. We have selected four essays, two by ladies, and two by gentlemen, and beg them to accept, in addition to our best thanks, a cheque each for one guinea. The names are Mrs. E. H. Way and S. A. J., and Mr. W. M. Laws and Focus Junior. *Place aux dames:* we shall publish the essays of the ladies next week.

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 2. On Sending Out Proofs; What I do, and Why I do it," to be sent in by the 1st Sept. No name need appear. For rules, see previous numbers of News.

⁂ "Stops."—In Mr. Wilmer's article last week "v_2" should have been set down "$\sqrt{2}$."

Stripes.—Your bath has become charged with alcohol or ether. Boil it down, or expose to the air in a flat dish. If you leave your plates in the bath longer than usual, moving them frequently up and down, the evil will diminish or disappear; but unless the bath is in good order in other respects, this course may cause other defects to arise, especially now the weather is hot.

C. B. L.—They arise from a too rapid flow during the coating. The whole operation should be much more deliberate than in the case of ordinary collodion, especially when the excess is poured off.

F. J. B.—There are classes and laboratory instruction at King's College, and also at the Cowper Street Schools, Finsbury; these latter classes being under the auspices of the City and Guilds Institute for the Advancement of Technical Education.

J. W. West.—1. You have omitted all mention of water in your formula, but the proportions given of gelatine, bromide and silver nitrate are calculated to yield a good result. A careful washing will be required owing to the use of a large excess of bromide; and you will find it better to add a portion only of the gelatine (say about one-fifth) before cooking; and then to heat rapidly to nearly the boiling point. 2. Yes, or nearly so. 3. Only as qualified above.

Photo Reader.—1. A mixture is made of 30 parts nitre, 10 of sulphur, and 6 of black sulphide of antimony, all materials being carefully dried. Six or eight ounces of this mixture, burned in a tin dish, will generally suffice for a portrait. 2. Yes.

J. Harris.—1. Each ounce of the nitrate must be dissolved in 12½ ounces of water. 2. There is no objection provided that the operation is performed with a moderate degree of rapidity.

Arthur G——.—The collotypic print is fairly good, although not first-rate. If you mix a small proportion of tallow with your ink, the drag on the film will be considerably diminished, but it is probable that the vigour of the pictures may be somewhat reduced.

Pyroxyline.—The mark looks like a comet arising from a skin of dried collodion being carried on the plate during the operation of coating.

Printer.—It is not an unusual thing to do intentionally what you have done accidentally. The prints obtained in this way are especially adapted for colouring.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1198.—August 19, 1881.

CONTENTS.

PAGE
The Technical Examinations of the City Guilds.. 385
Optical Arrangements for Enlarged Pictures 385
Photography In and Out of the Studio 386
The Discussion on Gelatino-Chloride Emulsion. By Dr. Eder 387
At Home—Messrs. T. and R. Annan at Sauchiehall Street, Glasgow 388
French Correspondence. By Leon Vidal 389
Notes 390
Topics of the Day—Reception-Room Notes: On Receiving the Sitter, and Taking an Order 391
City and Guilds of London Institute for Advancement of Technical Education 392
Correspondence 394
Proceedings of Societies 395
Talk in the Studio 396
To Correspondents 396

THE TECHNICAL EXAMINATIONS OF THE CITY GUILDS.

The recently-established Institute for the Advancement of Technical Education bids fair to ultimately become of great service in furthering the advance of industrial art. Although established, as it were, but yesterday, it has organized examinations in no less than thirty-two distinct technological subjects, these examinations being simultaneously held at various stations, including most towns noted for great industrial activity. In many cases instructional classes are instituted in connection with the examinations; and we find, by reference to the programme for the present year, that there are already no less than 118 registered teachers actively engaged in provincial towns.

When the central technical college in London is finished, we have no doubt that it will prove of the greatest service, as notable facilities will be afforded for the experimental elucidation of special points which may occur to those interested in industrial operations; and all can appreciate the advantages resulting from such an arrangement, as those engaged in industrial work have very frequently no laboratory accommodation for conducting experimental operations which it may be desirable to perform.

Next year some changes will be made as regards the details of the examinations, the most important of these being that each subject will in future be divided into two grades only, instead of three, as in previous cases. The sub-committee, in a manifesto dated August 5, 1881, gives four elaborately-worded reasons for this change, the third being as follows:—

"3. Because many of the examiners experience considerable difficulty in preparing sufficient questions to cover three separate papers, and are consequently unable to vary their questions from year to year as thoroughly as is desirable."

Surely this difficulty need not occur in such a subject as photography; and it strikes us that in most cases a failure to find suitable questions should rather reflect on the examiners than on the subject matter of the examination. Sub-committees should learn and abide by the first principle of statemanship—viz., never to give a reason.

At the examinations held in May last, over eight hundred candidates passed, and seventy-eight medals were awarded; while in the section of photography alone, eight candidates passed, these being John Jenkin Morgan (silver medal), Arnold John Spiller (silver medal), Thomas John Chilton, Lillian Hawkes, William M. Ashman, S. T. Loxton (bronze medal), Katie Wells, and Byron Carr. In another column we reprint the questions, and also those in 1880.

The elementary questions are fairly easy; but, as regards the third clause of the fourth question, we may suggest that many who have not made a careful comparison may be unaware that it is possible to obtain faint gradations of shade in a (so-called) carbon print which cannot be realized in the case of a *toned* and *fixed* silver print. Such questions as No. 8 in the advanced grade are useful, as testing the knowledge of the candidate regarding the use of chemical equations in calculating quantities, a point with respect to which many photographic practitioners are deficient. The important question of iodide in emulsion is brought into notice in the Honours paper; and it may be considered that the questions generally well cover the most important points of photographic interest.

The paper last year, which we also print, may, perhaps, be regarded as being of a rather more practical nature than that of 1881; but, no doubt, there are excellent reasons for this. As regards the text-books recommended for the study of candidates, we think that the list might be extended with advantage.

◆

OPTICAL ARRANGEMENTS FOR ENLARGED PICTURES.

Second Article.

We now pass on to a study of the circumstances under which a condenser is required by the photographic enlarger, and as many desire to use artificial or direct solar light, it is of considerable importance that this matter should be thoroughly understood.

When the immediate source of light is an incandescent body which only subtends a very small angle, such as the sun, an electric arc, or heated lime cylinder, a condenser becomes necessary, or an image of the source of light would be formed by the objective, and projected, with more or less distinctness, on the focussing screen and the sensitive surface.

The condenser is used in such a way as to itself produce an image of the source of light, and care must be taken that this image is formed in such a position that the objective cannot project even the vaguest or most ill-defined reproduction of it on the focussing screen. The condition of things above referred to can only exist to perfection when the image of the source of light as formed by the condenser is produced exactly at the optical centre of the objective, and under these circumstances a cone of uniformly diffused light will stream out from the object-glass, and if this cone be cut by a white screen at any point, the illumination will be uniform and free from those ghostly images of the light which often mar lantern exhibitions and spoil photographic enlargements. It should, however, be premised that in order to theoretically fulfil the conditions above referred to, the source of light should be a point; in actual practice, however, no inequality of illumination arises unless the source of light is very large and close to the condenser, as in the case of a large flamed paraffin lamp.

The above considerations show that the relative positions of the condenser and the objective must not be altered when once the adjustment has been made, and, in actual practice, it is sufficient to assume that the position of the diaphragm represents the optical centre in the case of a doublet lens, which form of objective should always be used for enlargements with the condenser.

The transparency or negative to be enlarged must be fixed to a carrier, which can be made to slide between the condenser and the objective, and all focussing must be done by moving this carrier backwards or forwards. It is scarcely necessary to say that condenser and objective must be so selected, as regards the diameter of the former and the focus of each, that the whole of the negative or transparency is illuminated by the cone of light at the plane where it yields a sharp image of the required dimensions; but under no circumstances must the fixed relation between objective and condenser be altered.

So much having been said regarding the general principles which must govern our operations in enlarging with the condenser, let us pass on to the study of practical details. As regards the condenser, the number of forms which have been devised is legion; but in actual practice the usual form, consisting of a pair of plano-convex lenses of crown glass, mounted with their convex surfaces next each other, answers all the requirements of the photographer. It is obvious that in many cases large condensers may be required, and these are not only very heavy, but inordinately expensive, and it has been suggested to make use of fluid condensers as a substitute. These can easily be made by cementing a plate-glass back to a concave glass such as is used for the convex mirrors used for decorating houses, a small round hold being drilled in the plate-glass for filling the condenser. When the electric light or lime light is used for enlarging, it is the best plan to mount the condensers in the partition separating two adjacent rooms, and to adjust the light one side, the enlarging apparatus proper being in the other room. An ordinary folding camera, in which the front is stationary, and the back movable by a rack-work arrangement, may be brought into requisition; the lens being carefully adjusted as to position, and the negative or transparency mounted in the dark slide, the front and back of this being, of course, left open. The remarks made last week as to the easel arrangements for taking the sensitive plate apply equally in the present case. When direct sunlight is used for making condenser enlargements, the apparatus must be so constructed that it can be turned towards the sun, in which case we have Woodward's or Monckhoven's solar cameras, both somewhat cumbersome, inconvenient for actual use in our climate, where sunshine is uncertain; or a mirror must be used to reflect the direct sunlight into the arrangement described above. This latter is a very simple matter if the condenser is mounted in a partition opposite a window of suitable aspect, it being merely necessary to adjust a mirror outside the window when solar light is to be made use of. In making use of solar instead of artificial light, two points must be attended to: in the first place, the distance between the condenser and the objective must be reduced in order to bring the image of the sun into the required position, namely, the optical centre of the objective; and in the second place, the mirror must be moved from time to time, in order to compensate for the apparent motion of the sun.

With the arrangement now described, this adjustment of the mirror is a very easy matter, and a heliostat may well be dispensed with. A small mirror, say about an inch square, is attached to one edge of the larger mirror, taking care that both are not exactly in the same plane, and when the adjustment of the large mirror with respect to the condenser is satisfactory, a pencil mark is made round the spot of light produced on the wall by the rays reflected from the small mirror. It is now merely necessary to occasionally move the mirror so as to keep this spot of light within the pencil marks. The advantage of this proceeding over an occasional moving of a solar camera during exposure is obvious, as no shake is communicated to lens, negative, and plate, when the comparatively distant mirror is moved. In actual practice, the use of a heliostat involves too much care to make the apparatus serviceable to the enlarger, and, moreover, the expense of even the simplest form is considerable.

The arrangement we have described possesses notable advantages, as it is equally available for enlarging by an artificial light, or by the direct solar rays, and the only permanent fitting required is the condenser mounted in a partition.

We imagine that a Swan's electric lamp will prove valuable for making enlargements, and we have found that one of them can be very satisfactorily worked by a small hand Gramme machine. Regarding this matter we propose to give more particulars shortly.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Electricity and Photographic Enlargements—Improvements in Gelatine—Photographic Birthday Cards—A Hint to Out-Door Photographers.

Electricity and Photographic Enlargements.—The electric light for enlargements appears to be coming into use in the United States. A New York photographic dealer says:—"You use the ordinary solar camera, but supplant the sun with an electric lamp. The negative is placed in the barrel of the camera, to which a mirror is affixed. The rays of light reflected from the mirror are passed through the negative and the condensing and objective lenses, and the photograph is thrown in an enlarged form on a sensitised surface in the rear. After the regular chemical manipulation, the enlarged picture is ready to be sent out. The advantage of the electric light for this kind of work is really immense. It makes the photographer completely independent of the weather, and he can work at night just as well as in the day time. It frequently happens that just at the photographer's busiest season (about Christmas time, for instance) the weather is very inclement. It often rains for days. But orders for enlarged copies of pictures intended for presents come in briskly. Formerly about three-fourths of our patrons would be disappointed. The bad weather would make it simply impossible to execute their orders, but now all that is changed; no matter in what numbers the orders accumulate, they do not worry the photographer. He sends them off to one of the enlarging houses which use the electric light, and they are all done on time, no matter what kind of weather there may be. Photographers value so much the certainty of getting their work completed in time that these houses always have all the work they can do. The charge by the electric light plan is no greater than with the use of sunlight. The cost to the enlarger is a little more, but that is far exceeded by the value of the time saved. The electric light for portrait taking will be slow in making its way into general use. Most photographers will prefer to stand by the cheap, old-fashioned sunshine; but it will be only a question of a few years till every extensive 'enlarging house' uses the electric light." It may be because this photographic dealer happens also to be connected with one of the leading electric lighting companies that he is so enthusiastic; but, after making all allowances, the fact of the adaptability of the electric light to photography yet remains. M. Faure's discovery of the possibility of storing electricity is an immense stride forward. The necessity of a steam engine to generate the electrical current must always have been a drawback save in very large establishments. Faure's apparatus, however, does away with all this.

Improvements in Gelatine.—Now that gelatine plates are in such general demand, the manufacturers of the raw material are beginning to turn their attention to the production of gelatine specially for the use of photographers. While in conversation recently with a member of one of the leading firms in this trade, we learned that a form of gelatine perfectly pure would be shortly introduced which would shorten the time occupied in the manufacture of the plates very considerably. We are not at liberty to say more on this subject at present; but we might at all events hazard the opinion that it is possible this new gelatine may increase the sensitiveness of even the already enormously sensitive gelatine plate. This increase of sensitiveness will, however, most likely be more due to its physical than to its chemical condition.

Photographic Birthday Cards.—We recently alluded to the subject of photographic Christmas and birthday cards. The enterprise shown by a foreign firm in giving prizes to the amount of over three thousand pounds to designers of Christmas cards shows the enormous demand that exists for these pretty *souvenirs.* We do not see why a permanent demand should not also be created for photographic birthday cards having on them the portrait of the sender. All that is necessary is a suitable card. If dealers in photographic stationery were to turn their attention to the production of designs including, of course, a neatly-turned sentiment, or a suitable quotation from one of the poets, we believe that a large business would spring up. As the head and bust would be sufficient, the portraits could be taken with but little trouble, and a special charge made which would bring the photographic birthday cards within the means of most people. Of course, for the rich, there is no limit as to expense; but even here more will depend upon the ornamentation of the card than the photograph. Indeed, we do not see why these cards, having a suitable space on them, should not be sold in the stationers' shops. People then could choose their own cards, and bring them to the photographer to be completed with the photograph. This would obviate the necessity of the photographer keeping a large stock of cards in order to suit the whims or fancies of his sitters.

A Hint to Outdoor Photographers.—The funereal aspect of photographic appurtenances is occasionally a drawback, especially when outdoor work has to be done. In out-of-the way places people look with respect on the camera, and endure its presence with tolerable equanimity, especially if it be fairly new, and the brass work well polished; but the dark tent and box they regard with an amount of awe which sometimes causes a little inconvenience to the photographer. Not long since an amateur who was working the wet process with a dark box arrived at a little provincial town, and knowing he should stay for a fortnight or so, determined from economical motives to take lodgings at a private house. But he reckoned without his host, or rather without his hostess, for at every place he enquired, the lady looked at him with infinite suspicion, and always ended by requiring "references," a condition very difficult to satisfy, for he did not know a soul in the place, and his friends were 200 miles away. At last, weary and footsore, he was about to give up his quest, when, on turning from a house where he had been met with the stereotyped reply, he heard someone say, "Pedlar." The key of the mystery was furnished. It was his dark box which had done all the mischief! He hastened to a railway station, "booked" his incubus, and returned once more to the charge. His first effort was successful, and not a word said about "references." *Verb sap.*

THE DISCUSSION ON GELATINO-CHLORIDE EMULSION.

BY DR. EDER.

As regards the question of the sensitiveness of gelatino-chloride emulsion, there is a constant difference between the experiments of Captain Pizzighelli and myself on the one hand, and Mr. Berkeley on the other hand. The last-mentioned experimenter would lead us to believe that by depreciating the sensitiveness of the gelatino-chloride emulsion, I am doing a considerable injustice, not only to the chloride of silver, but also to him personally. This assumption is, however, erroneous, as I beg to assure Mr. Berkeley that it would have given me the most intense pleasure to have been able to attribute a high degree of sensitiveness to the compound in question; indeed, I set out with the hope of being able to prepare a chloride emulsion which should surpass the ordinary gelatino-bromide as regards sensitiveness. Captain Pizzighelli and myself fully recognised the fact that $AgCl$ is far more easily reduced by chemical agents than is $AgBr$; and we fully appreciate the circumstance that all ordinary developers might be expected to act more energetically. An experimental illustration of this is simple. Let some $AgCl$ be precipitated in a test tube, excess of $NaCl$ being used; while in another similar test tube some $AgBr$ is similarly produced. Both are now treated with alkaline pyrogallic or with the ferrous oxalate developer, and provided that actinic light has been excluded, the chloride alone is darkened. In further illustration, it may be mentioned that neutral pyrogallol reduces exposed silver chloride, but not the bromide. In gelatine emulsion the action of silver chloride is somewhat better, for the gelatine acts as a preventive of fog. We have tried over thirty different developers, some strong and others weak, the results proving that better and cleaner pictures were obtained with the weaker solutions; but in every case the sensitiveness of the chloride proved to be but slight. Indeed, we were compelled to expose some seconds by daylight, or many minutes by gaslight, in order to obtain contact transparencies, although in less time bromide plates would have been solarised. It is true that by the use of a stronger developer that the sensitiveness was somewhat increased, and by adding hyposulphite of soda to the ferrous citrate developer it became possible to obtain a camera picture with double the exposure which a wet plate would have required; while by the use of Abney's new double developer of citrate and oxalate,[*] a somewhat shorter exposure than this served. I think, however, that Mr. Berkeley is hardly right in quoting these recent experiments as proving the inaccuracy of my former investigation, as it was then a question of the ordinary oxalate developer.

Silver chloride may be universally regarded as being less sensitive to light than the bromide, as proved by our own experiments and those of Vogel; this experimenter having especially noted how much more slowly silver chloride darkens in the light than silver bromide, it being understood that excess of the soluble chloride or bromide was used in precipitating the silver salt. Similar observations have been made regarding these compounds in gelatine emulsion, by Pizzighelli and myself.

On the contrary, chloride of silver precipitated with excess of silver nitrate discolours more rapidly in light than is the case with silver bromide (Vogel), and there may perhaps be some hope that gelatino-chloride emulsion plates may be made considerably more sensitive by being soaked in an alcoholic silver nitrate solution containing about one per cent. of the salt. I claim the priority of this idea, and intend working out the question.

There can be no doubt whatever that the sensitiveness of the normal chloride of silver plates (prepared with excess of sodium chloride) is for the less refrangible rays much less than that of the normal bromide plates, as the former requires a ten times longer exposure, and the image does not go so far into the yellow as in the case of the latter.

Although the results of spectrum photography are somewhat variable, and depend much on the state of the atmosphere and the material of the prism, this much is certain, that we found the maximum of action on chloride emulsion developed with ferrous citrate not to be in the ultra-violet (as stated by Abney), but in the neighbourhood of the line I, in the blue. This we detailed in a communication to the *Correspondenz*. But it must be remembered that we worked in the early part of the year, a season when the intensity of the ultra-violet rays is less than in summer; and this circumstance, no doubt, accounts for the difference between our results and those of Captain Abney. As regards the want of sensitiveness to the red and yellow rays, the views of Captain Abney and myself are identical, and the assumption of Mr. Berkeley must, therefore, be regarded as untenable.

---

[*] Photographic News, 1881, 368.

◆

At Home.

MESSRS. T. AND R. ANNAN AT SAUCHIEHALL STREET, GLASGOW.

Messrs. Annan, of Glasgow, deserve honourable mention, if only for this: they are the one firm of photographers north of the Tweed which manufactures and uses its own carbon tissue. Many of us know the difficulties and vexations of carbon printing; but few have had the courage to make tissue for themselves, and fewer still continue to do so in spite of heart-breaking failure and systematic discouragement. Messrs. Annan Brothers have for years steadily clung to the production of carbon tissue, and at their works at Lenzie, near Glasgow, have succeeded in producing a material of excellent quality, as abundantly proved by the transparencies and enlargements which issue from the firm.

At Lenzie, too, Messrs. Annan have a manufactory of gelatine plates, but in the present paper we shall confine ourselves simply to a description of the Glasgow establishment, which furnishes us with matter quite sufficient for our purpose. Here, in the gallery at Sauchiehall Street, we perceive at once one very important fact; namely, that permanence in photographic prints is one of the principal aims of Messrs. Annan. Look at this carbon print upon opal, representing Sir Noel Paton's "Fairy Raid." It is a photograph finished in black and white, we are glad to hear, by the artist himself, a circumstance alone that deserves record, since it shows that photography is no longer looked upon with such jealous eyes by painters. This carbon print upon opal measures no less than four feet, certainly the largest and finest we have seen of the kind, while we need scarcely speak of its excellence and beauty, since it has been so highly appreciated by Sir Noel Paton. Messrs. Annan have published many works of art of this kind, and as photographic publishers, indeed, they take very high rank. Here is a series of portraits of the professors of Glasgow University, both taken and printed in carbon by Messrs. Annan, than which no finer collection of its kind has appeared. The portrait of Sir William Thompson, the electrician, is one of the best of them—they are taken 8½ by 6½ inches—and it is something to reflect that such good portraits are printed in permanent pigments. Here is a volume containing the divinity professors, and yet another filled with those of the medical staff, all of them names famous in the University world. In fact, Messrs. Annan might well be termed photographic publishers to the University, for we find still another volume filled with views of the Old College, which dates back to 1450, photographs that must be dear to all those inhabiting the second city of the empire, as we believe Glasgow is now entitled to rank.

Another excellent series of pictures we must allude to before we pass from this subject. They depict the whole of the painted windows in Glasgow Cathedral, and form a valuable record of this branch of the art. There is almost colour in some of these casements, so delicate are the half tones; while the "staining" effect upon the glass could scarcely be better in the original windows. There is not, strange to say, a single instance of halation or blurring in these window pictures, which represent masterpieces of the modern German school. They are the work of Hess, Schrandolph, and Moritz von Schwind, the last-named artist distinguished more especially by his being chosen to renovate the Castle of the Wartburg in Germany, revered by the whole Lutheran Church on account of Luther having translated a large portion of the Bible within the venerable pile. The art of modern window painting—so far, at any rate, as designs go—may well be studied from this fine series of photographs, which puts vividly before the student, sitting at home at ease, transcripts of the master's work. Indeed, in glancing over these valuable publications of Messrs. Annan, the idea comes over us now and again, whether such work is sufficiently recognised. At Messrs. Braun's establishment in Dornach, which we visited a dozen years ago, a great deal of work of a similarly classic character is also prepared, and we could not help calling to mind the Alsace studio as we examined Messrs. Annan's photographs. Fortunately, as in the Dornach establishment, these reproductions are all in carbon, and hence we may trust that the work undertaken at such great expense may, by reason both of its intrinsic value and permanence, be ultimately a source of profit to its progenitors.

As landscape photographers Messrs. Annan enjoy an enviable reputation. In London, we have repeatedly been made familiar with good work from the Glasgow studio, but to thoroughly appreciate its skill and taste it is necessary to examine the beautiful pictures of exteriors and interiors of Scotch strongholds which here adorn the walls. Here is princely Glamis Castle with its rounded turrets and spires, its grey walls, its weather-beaten casements, and handsomely wrought stone work. Here is Alnwick Castle, its fine lines sharp and clear in the leafy landscape; here Dumbarton Castle on the Clyde, and here again Hamilton Palace. But better than all, are these interiors taken on 16 by 13 plates, some by a Dallmeyer 12 by 10 rectilinear, and others by a Ross wide-angle lens. The "Duchess' Bedroom," for example, is perfect; the satin bed furniture, the quilted coverlid, the folds in the rich drapery, are rendered as softly as by the painter's art, while yet they possess all the detail and clearness of photography. "The Library," Hamilton Palace, is not less successful; the furniture, the book-cases, the table-cloth, all are rendered with surpassing harmony and clearness, as if, forsooth, the photographer had chosen accessories of his own shade and hue, in order to secure the highest effect. There is no blurring, no halation, no solarisation; the light is diffused as evenly and effectively as in a well-lit studio. All these interiors were taken with wet collodion, some of them with nearly an hour's exposure. Says Mr. Thomas Annan:—"I use gelatine plates of our own making for interiors now, but we have not given up the use of collodion for outside work."

We go upstairs. Here are carbon prints and carbon transparencies in various stages. Impressions measuring 24 by 18 inches are considered but ordinary work, and three-feet pictures are not made much fuss about. The enlarging is done in the usual way from a carbon transparency, produced by printing upon tissue under the original negative, and in this way securing a vigorous, transparent positive. Some of the red-tissue prints of Messrs. Annan are very successful. A huntsman surrounded by his pack on the steps of a hunting-box looks like an old engraving by Hogarth; and so anti-photographic is it in appearance, that one wants the assurance of the printer almost to believe it.

The studio is spacious and roomy. It is lighted from the north; but the sun itself never gets into it the whole livelong day. What there is of wall on the light side of the studio is painted dark, while the bare glass is, for the most part, obscured by curtains of very dark blue. On the shadow side of the studio the walls are of a light tint. One feature deserves special mention. The slope of the roof is but slight, and on both sides it is glazed; but, on the shadow side, the glass is covered in by seven or eight boards, their ends towards the apex of the roof. Under ordinary circumstances, therefore, they permit no top side-light to enter from the shadow side. At times (in winter more especially) light is, however, desirable from this particular direction. For this reason the planks are hinged lengthways, and capable, therefore, of falling or assuming any slope (and therefore casting more or less light) towards the object to be photographed. Two cords (one near each end of the plank or board) permit of moving the plank, and either allowing it to fall altogether, so that it hangs edgeways, or of pulling up the flap flat with the roof, in which circumstance no light at all enters.

The dark-room is one of the best ventilated we have seen. There are two ventilating shafts, one on each side of the apartment, with pipes no less than eighteen inches in diameter. The shafts are not only bent at an angle, like a magic-lantern chimney, to keep out rays of light, but there is, moreover, placed at a short distance below the orifice of each a dead-black disc, to make security more secure.

The "By-the-Bye" next week will be "Pawnbrokers' Bargains." The following "At Home" will be, Messrs. Alexander Brothers, at Renfrew Street, Glasgow.

FRENCH CORRESPONDENCE.

Method of Reducing the Intensity of Gelatine Plates—Mr. Stebbing's Sensitive Pellicle—Gelatine Rendered Insoluble by Alum—A New Laboratory Lamp.

Method of Reducing the Intensity of Gelatine Plates.—The closing meeting of the session 1880-81 of the Photographic Society of France was held on the 5th of August last, and I will give a short account of some of the more interesting communications. M. Andra, recurring to an idea which was formerly published by M. Davanne, recommends the use of iodine water as a means of reducing the intensity of gelatine plates that have been over-developed. If a plate of this kind, after being fixed and washed, is plunged into the liquid, a coating of silver iodide is formed upon its surface by the action of the iodine upon the reduced silver of the negative. The plate is then immersed in a solution of sodium hyposulphite, which dissolves the silver iodide. If the first operation does not produce the wished-for effect, it must be repeated a second time, or even, should it be necessary, several times, until the necessary degree of transparency has been obtained. This is a very simple method, and one which offers no risk, provided that care be taken not to use too strong a solution of iodine in water. M. Davanne recommends the operator to have always at hand in his laboratory a sufficient quantity of this iodine water, since it may be used as well for restoring a negative which is too weak, as for reducing one which is too vigorous. To restore a weak negative, it must be plunged into the iodine water, when, as before, a film of silver iodide is formed upon it, but in this case the film must not be dissolved by hyposulphite. Silver iodide being yellow in colour, the impermeability of the weak negative to the actinic rays will be increased. There are several methods of making iodine water, since iodine is not sufficiently soluble in pure water. Two grammes of potassium iodide may be dissolved in a hundred grammes of water, and two grammes of iodine added to the solution. But a better method is as follows. A few crystals of potassium iodide are dropped gently into a flask full of water, but without shaking the flask, and then some grains of iodine are also dropped into it. The latter, being in contact with water containing iodide of potassium, dissolves very rapidly; the mixture is then well shaken. From the colour of the liquid the state of dilution of the iodine may be judged. Before using, the best way is to make a trial upon a damaged negative, and its effect may than be recognised, and if it is too strong, water may be added. In methods of reduction it is better to proceed by trial than to force the action, which would be running the danger of spoiling the negative.

Mr. Stebbing's Sensitive Pellicle.—Mr. Stebbing has greatly improved the manufacture of his sensitive pellicle, and the method of manipulating it. He exhibited before the Society the whole of his process, both the preparation of the pellicle, its exposure in the camera, and its development. It may be of some interest to our readers to have a short account of this process of our ingenious colleague. Gelatine is run into a frame, having at the bottom a glass plate coated with some insulating material, in such a way as to form, after it has been dried, a film of from a quarter to a half millimetre in thickness. This gelatine is passed into a solution of potassium bichromate, and after being dried it is exposed to sunlight, so as to render it insoluble; it is then washed in order to remove any excess of bichromate. Over the surface of this layer of gelatine the bromide emulsion is then poured, and allowed to dry. The sheet of gelatine is then separated from the plate, and cut to the required size. For the exposure the pellicle is best placed between two glass plates. It is then developed by placing it at the bottom of a basin of the same size as itself, the edges having been previously greased with a little tallow, in order to prevent the water from penetrating between the layers of gelatine. The developer is then poured quickly on it, and, when the print is sufficiently brought out, it is poured off again into another vessel. The plate is then washed, and the hyposulphite solution poured over it in the same basin. After fixing, it is again very rapidly washed (always in the same basin), and a solution of chrome-alum is poured on it; it is then once more washed, in order to remove any excess of alum. When this is finished, the pellicle is delicately lifted up by one corner, and removed from the basin, in which a little water has been left, in order to facilitate the removal. The pellicle is then placed, with the emulsion side upwards, on a glass plate which has been rubbed with talc, and which is a little larger than itself. It is then covered with a double sheet of blotting-paper, and the squegee is passed over it to press out any bubbles and all the superfluous water, and, finally, strips of paper are glued along the edges. In drying, the pellicle becomes completely stretched. When it is dry, the surface is varnished with raw collodion, and, so soon as the latter is quite hard, the strips of paper are cut through, and a pellicular plate is produced, with a perfectly even surface. I have had the opportunity of seeing Mr. Stebbing go through the manipulation which I have just described, and I am glad to be able to express a high opinion of the simplicity of this method. Of course, there is one great advantage in using sensitive pellicle, not only for tourists, who are thus relieved of carrying with them packages of great weight and size, but also for stationary photographers, for whom it is much more easy to keep and classify plates of this kind in their portfolios than to store away those which are made of glass. There is every reason to hope that plates of pellicle will soon be able to be substituted for those of glass.

Gelatine Rendered Insoluble by Alum.—Now that the use of gelatine films is so common in photography, I cannot too strongly recommend the practice of tanning the plates—that is, of rendering the gelatine insoluble by means of alum. When treated in this way they will keep much better. For this purpose, to the solution of gelatine must be added about a-half per cent. of alum.

A New Laboratory Lamp.—M. Laverne sent for exhibition to the meeting of the Photographic Society a lamp glazed with ruby glass for use in the dark room. This lamp differs only in a slight degree from those which have hitherto been used for the same object, but it has the advantage of being very portable. In discussing this subject, some of the members complained that it was very tiresome to be obliged to carry on all the operations of the gelatino-bromide process in almost perfect darkness, where it is extremely difficult to see what one is about. This seems to me to be an error; it is not long ago that

Dr. Kenyon showed that by his process an emulsion could be prepared in a tolerably bright yellow light; and as regards development, it is quite certain that when once the plate is immersed in the developer, a yellow glass may be substituted, without any risk, for a red one. There are, therefore, only a few who think themselves compelled to work under the same circumstances as the miner. It is quite possible to carry on all photographic operations, even those depending on so sensitive a substance as gelatine, without being condemned to live in an oven. Moreover, it seems scarcely necessary to point out that it is not so much the quantity of light as the quality which is injurious; it is quite possible to see very tolerably in a red light, which has no action on silver bromide. Leon Vidal.

Notes.

An entirely new explosive, more potent than gun-cotton, is announced, made, we are told, from a most useless waste product—to wit, pine shavings. The statement is something like that of the old French serjeant who protested he could make a capital soup by merely stewing pebbles; he said nothing about the things that were added when the pot began to boil—the vegetables, gravy, salt, and pepper, &c. So with the pine shavings; we are told nothing of the costly nitric acid that is required for acting upon the wood to convert into a nitro-compound, as the photographer converts cotton into guncotton.

In fact, with regard to all these new compounds, the photographer should bear in mind one thing: that they are nothing more than his old friend guncotton in a new phase. Whether it is called pyroxylin, nitro-glycerine, dynamite, cotton powder, pyrolignine—that was the name given to the sawdust explosive found in the Fenian torpedoes at Liverpool—mataziette, saxafragine, lithofracteur, blasting gelatine, dualine, tonite, glyoxyline, &c., &c.—they may all be classed as the same mechanical compound. It may be a solid, such as cotton fibre, wood fibre; or it may be a liquid rich in carbon, like glycerine, that is treated with nitric acid; the result is a replacement of some of the carbon by a nitrogenous body, and the formation of an explosive in the form of a nitro-compound.

So that in respect to these new-fangled explosives, it is only their names that are novel. Cotton powder is guncotton reduced to a fine state of division, and tonite is the same with the admixture of a nitrate. Dynamite is simply an earth saturated with nitro-glycerine, and lithofracteur is much the same thing with a little saltpetre and sulphur added. Dualine is guncotton soaked with nitro-glycerine, and blasting gelatine is not gelatine at all, but nitro-glycerine in which guncotton has been dissolved, forming a sort of jelly. Glonoine is another name for nitro-glycerine, and saxafragine and matazictte are *aliases* for dynamite.

In short there are only two bodies—one solid, and the other liquid—and these two bodies, guncotton and nitro-glycerine, are practically the same thing.

The International Exhibition of Electricity opened in Paris last week. One of the attractions is a series of 800 of Mr. Swan's lamps all working at once; another is a perfect theatre with electric footlights on the Wendermann system.

Cut or tear out a square of paper, one side being equal to the diameter of your largest stop; halve this by folding from corner to corner, and fold the triangle thus obtained so that both the acute angles of the paper coincide; after which, divide at the fold.

Either one of the two equal sides of the triangle thus obtained represents the diameter of a stop requiring double the exposure required by the largest. Fold once more, so that the acute angles coincide, and again divide, when either one of the equal sides will give you the diameter required for an exposure of double that required with the last-mentioned stop, or four times that required by the first.

By continuing to halve the right-angled triangles as above described, the diameters required for the following exposures will be obtained: 1, 2, 4, 8, 16, 32, 64, 128, and so on, a series quite comprehensive enough for all practical purposes.

This method of working, which is the outcome of Mr. Cowan's study of the ideas recently put forward by Mr. Wilmer, should bring the "iris" or adjustable diaphragm into use for photographic lenses, these being at present but rarely fitted with it.

The ferrotype has led to a large increase in the ranks of peripatetic photographers. On Saturday last, we counted at the Elephant and Castle Station no less than seven fully equipped ferrotypists on their way to Margate and Ramsgate by one of the morning trains. A black oblong box, with tripod and black fabric strapped thereto, and which could easily be stowed away under the seat, included each man's paraphernalia.

Five minutes, one of the travellers told us, was the average time that a quick-working ferrotypist required to take an order and execute it; but this period was evidently considered too short by his comrades. In the end, the conversation led to a good-humoured offer on the part of our neighbour to try conclusions with any of the company—in fact, to make a race of it in the production of a portrait. Our destination, unfortunately, was not Margate, or we should have been glad to witness the competition.

But supposing even that five minutes sufficed for the production of a portrait, this does not come up to the rapidity of the "profeel macheen," that Sam Weller assured us was ready to "finish a portrait, and put the frame and glass on complete, with a hook at the end to hang it up by, and all in two minutes and a quarter." Thus, our friends—the ferrotypists—are still behind the age.

The British Association meets at York on the last day of this month.

This is the law in Germany touching ownership of the negative, according to a recent decision of the courts. A customer can only be regarded as the owner of the negative in the event of his paying a price for it, and having previously stipulated for its possession. Otherwise the negative is not the property of the customer, but the latter may insist on its destruction by the photographer.

Two deaths by poisoning with cyanide of potassium have been recently recorded. One, that of a barrister, was due, there is good reason to believe, to a supply which had been obtained for photographic purposes; but in the other case, that of a soldier, the cyanide swallowed was intended for cleaning gold lace. The war authorities, it is said, are about to substitute some less dangerous material for cleaning soldiers' ornaments, and it would be well if photographers were more careful to keep cyanide out of inexperienced hands. It is seldom there is any actual necessity for cyanide, and we know of many who are able to get on very well without it altogether.

In poisoning with cyanide there is so little chance for the patient. The rapid swallowing of an emetic—warm water is generally the best, because it is handiest—followed by any solution of iron that may be near, is the quickest rough-and-ready remedy; but there is seldom time to employ even this. In a case of poisoning we had the misfortune to witness some years ago, the patient's jaws were rigidly closed within three minutes of the event, and by the time the emetic was brought, ordinary means failed to open the mouth. When the jaws were subsequently forced to make way for the stomach-pump, it was too late

Topics of the Day.

RECEPTION-ROOM NOTES: ON RECEIVING THE SITTER, AND TAKING AN ORDER.

BY MRS. E. H. WAY.

An attractive reception-room is of the utmost importance. On the taste with which its furniture and accessories are arranged and kept, and the scrupulous cleanliness and order apparent in every detail of this department of the photographic studio, more of the success of a business depends than many persons imagine. First impressions are here, as everywhere else, potent—here, perhaps, more than any other place; for not only is the order the sitter may give influenced by the impression of the moment, but, if an agreeable emotion is awakened in the mind of the sitter, the work of the artist is rendered more easy and successful.

Attractiveness of the reception-room clerk is not less important; and here I may say that a woman is to be preferred to a man for this position, as she is more capable of entering into the minutiæ of the visitors' wants, a large proportion of whom are ladies and children. The attractiveness of the reception-room clerk should be, in a pleasing manner, combined with ready conversational powers—sensible, direct, and cheerful. With respect to matter and manner, it is, of course, impossible to do more than give some hints for the guidance of the novice. It should be borne in mind that, on a business matter, the tendency of the talk should be towards business—this, even if the sitter should be inclined to be chatty. I do not mean that the conversation should be rudely or palpably dragged back to the subject, but a little tact will suffice to lead the wanderer into the right path. For all this, it is very necessary that the clerk should be able to converse pleasantly and well on all the ordinary topics of the day; for very often it devolves on the reception-room attendant to amuse sitters, waiting their turn, by conversing with them, drawing their attention to pictures, &c., and enlivening what is to many a *mauvais quart d'heure*.

For the entertainment of visitors, the reception room should itself, in a great measure, provide. The most attractive specimens of photography should adorn its walls, fine examples of oil and water colour, crayon, and other large work; pleasing varieties of portraiture, tastefully displayed, would prove of interest to most sitters. The pictures of children, too, are always regarded with gratification. Illustrated papers and magazines will also assist, and albums of pictures are useful in helping to wile away the time of waiting. The decoration of the reception room should be carefully attended to; nothing that could prove discordant to good taste should be apparent.

In a well kept show case, attractive frames, mounts, passe-partouts, lockets, albums, &c., may be exhibited, and, by judiciously drawing attention to them, prove a profitable branch of business. Showing a frame suitable for presentation will often lead to an order for a large picture to take the place of a more commonplace gift for birthday or other occasion.

In many ways the tact and ingenuity of the reception room assistant may be exercised with advantage, to show sitters in what a variety of forms photography proves useful and pleasing.

In meeting the visitor who is desirous of making choice of a style of portraiture, it is desirable for the assistant to first gain, if possible, some idea of what the customer desires. Some intending sitters have *no* idea, but generally there is a more or less definite wish for a certain style, and it is necessary to acquire a knowledge of this before making any suggestions. It sometimes requires some ingenuity to gather up the disjointed directions of a vague and absent-minded sitter into something like a coherent order.

The advice I have given to the assistant not to make suggestions too early may appear superfluous; but I have seen customers carried away by the suggestions of the assistant to give an order which calmer reflection has not approved. Never try to dissuade a sitter who has formed a decided wish in any direction. If it is possible, carry it out, even if not so suitable to your mind. Spare no pains to make the sitters satisfied, not only in the present moment, but after they have left, and with the pictures when they are completed. Get a clear idea of what is required. We will say a dozen cards, two positions—one a large head profile. (Here, possibly, it may be well to suggest that the customer should consult the artist on the subject; the lady has, I notice, an unattractive outline in profile; but she told me a friend had a lovely picture taken in that style, and she wishes the same. I explain that it is always more satisfactory to leave the artistic arrangements to the artist, and that what is suitable in one case is not always so in another). I get an order for the colouring of three pictures, and sell two frames and a locket. Without any pressure the money is paid, the order fully booked in the day-book, and the amount received entered in the cash-book. While the lady is waiting her turn, I show her some of the pictures in an album, purposely turning to a beautiful three-quarter face, lighted *à la Rembrandt*, with which she at once falls in love. Perhaps it is not strictly the duty of the reception room assistant to interfere in artistic arrangements. Well, I do not often—never, except in such cases as that quoted. The style of picture having been decided on, the visitor will often require some slight assistance in her arrangements, or advice regarding ornaments, &c. Give your opinion modestly, with the reason for preference, and make any suggestion that may appear desirable.

Take an interest in the success of the sitting, and show you do. By your easy and pleasant manner, far removed from familiarity or assumption, place your customer on good terms with herself, and she will be more likely to make a favourable portrait than if uncertain or anxious about the details of her costume, or allowed to grow weary for want of attention.

It is obviously impossible to give undivided attention to each visitor, nor is it necessary; the tact and good sense of the attendant will suggest many ways of showing their presence is not forgotten, or their interests neglected—this, whether the visitor is a lady or gentleman. Children are readily amused, and can easily be kept in good humour, by a skilful person, without too great an expenditure of time.

By the time the artist is ready to receive the visitor, I have written on one of the slips of gummed paper kept for the purpose the name of sitter, style, and number of portraits required, which I send by the person engaged to see visitors to the studio. This paper is given to the operator, who sees at once what style of picture is required, and there need be no delay in his work. This gummed paper is stuck on the negative, when taken, so that, however hurried he may be, there can be no mistake as to name of sitter, &c. When the sitter comes again into the reception-room, I ask if she will allow the artist to take notes for colouring, submit further specimens of colouring and enlargements, pointing out the advantages of each, and, if any addition is made to the order, adding it to the entry already made in the day-book.

It may be thought that now all responsibility of the clerk ends until the pictures come again into her hands to be packed. But the order should not be lost sight of, and any promise made as to time, or mode of sending, should be fulfilled, to do which, very often, many reminders have to be made to other employées in the establishment. I need scarcely allude to the importance of accurately entering appointments in the appointment-book, from which a copy should be made each morning, and sent to the studio.

Fearing I have already taken too much space, I can only say, in conclusion, that the dressing-room and toilet requisites should always be clean and fresh, and the room kept in perfect order.

BY S. A. J.

In the previous articles on "Reception Room Duties" and "How I Keep My Books," which appeared some few weeks ago in the Photographic News, the reception room ladies (whose valuable papers, I have no doubt, have given great assistance to some less experienced sisters of the pen and brush) seem to have junior ladies to assist them, which is not always the case in a medium class trade; so perhaps it would be advisable to state that I am engaged in one of the principal studios of a large manufacturing town where aristocracy is rather rare, so that our business depends chiefly upon the middle class for its support, and such being the case, different modes of receiving the sitter and taking an order have to be observed.

Perhaps it will not be out of place to give a slight outline of the premises, which are situated in a busy thoroughfare. We have a good front window, in which we show all kinds of portraiture, from small C.D.V.'s to 30 by 25 enlargements. The shop makes the first reception room, in which I have a specimen of each of the various kinds of pictures hung up, with the price ticketed on. I also have a counter fitted up with drawers, in which I keep my photos. ready for delivery, books, &c., each drawer being labelled. On the top of the counter I keep a set of albums, one containing silver prints, the second tinted photos., and the third chromotypes. Immediately beyond the shop are the dressing rooms, and lavatory adjoining the waiting room, in which is the studio staircase.

When the sitter enters, I produce the first-named album, and show specimens, commencing at the lowest price, and then introduce the second and third. In this manner I generally succeed in obtaining a better order than was at at first intended, at all events by the sitter. When it has been decided what kind of photo is required, I enter the name and address in a ticket book, and give the sitter a duplicate copy of the ticket, which they show to the operator, and produce when they come afterwards for their cartes. I then show them into the dressing room; and here I may state that I am often requested to assist ladies, and, as far as I possibly can, I always make it my duty to oblige them, as it makes them feel more at home, and I find that we generally have more re-orders from sitters who are assisted in this way than otherwise.

When they are ready for sitting, they pass into the waiting room, where they find albums, books, &c., with which to pass away the time until the previous sitter retires.

From thence they are shown upstairs to the studio, where, as I mentioned previously, they produce the ticket, and the operator sees at a glance the kind and size of picture required, so that there is no need for any delay, and as dry plates are exclusively used in our studio, the sitter is soon released, as some of them think, from an uncomfortable position.

When they come down, they are pointed out framed pictures from 15s. upwards. I endeavour to always show them some one whom they are likely to know, as they seem more disposed to give an order when they see a good picture of a friend or of some well-known person. In this way I am often successful in obtaining an order for an enlargment from the negative just taken. Of course we have some customers whose "amiable" disposition would not allow them to have anything more than they intended when they first entered, even if you made them a present of the pictures; but I find there is never any harm done by showing specimens of all sizes.

And now a few words about receiving children: some of us know, to our sorrow, that a few of the dear creatures are a far way from possessing angelic tempers—in fact, some we dare not even look at; others return home with anything but a smile, and refuse to be comforted, because they have to leave behind them a rocking-horse which we have in the studio. In one instance, a little fellow was passing the place about six months after he had been photographed, and he came to the door crying, and refused to go any further until his mother promised to buy him a similar horse.

The first thing I do with children is to try and get on intimate terms with them, and then use a bribe in the promise of a picture if all goes on well. I find it often takes good effect on most of them; a few others are like their above-mentioned elders, too "amiable" to receive anything, though I am pleased to say we have never had a single failure with a child's photograph since we commenced using gelatine plates nearly three years ago.

The picture is a card with a coloured print on one side, and an advertisement on the other, so that it serves a double purpose.

In conclusion, I hope it is almost needless to say that a pleasant face and kind manner are always beneficial to any business; and whatever class of customers we may have, let us always behave courteously, and try and bear in mind that kindness begets kindness.

CITY AND GUILDS OF LONDON INSTITUTE FOR ADVANCEMENT OF TECHNICAL EDUCATION.

Technological Examinations—1881.

Questions Set in Photography.

Instructions.—The candidate must confine himself to one grade only, Elementary, Advanced, or Honours, and must state at the top of his paper of answers which grade he has selected. He must not answer questions in more than one grade.

If he has already passed in this subject, whether in the first or second division of any grade, he must select his questions from those of a higher grade.

In all cases the number of the question must be placed before the answer in the worked paper.

Three hours allowed for this paper.

Elementary.

1. State why bromide as well as iodide is used in the collodion employed in the wet process.
2. How should you proceed to find out the cause of veil (fog) on a wet plate?
3. Give a formula for a nitrate of silver solution for sensitising albumenized paper which contains a medium amount of chloride.
4. Compare a carbon print with a silver print as regards—1st, permanency; 2nd, facility and rapidity of production; 3rd, delicacy of detail.
5. Trace the course of a mono-chromatic ray of light through a prism, and state any law you may know regarding the path it takes.
6. Give an outline of the method you would adopt in preparing a gelatine emulsion.
7. What are the functions of Tripoli powder, ammonia, and spirits of wine in cleaning a glass plate?
8. What is the usually accepted theory of the formation of the visible image on chloride of silver?

Advanced.

1. Single achromatic lenses of the meniscus form are usually employed for landscape work. Give a sketch of such a lens and the position of the diaphragms (stops). Give the reason for adopting this form of lens, and also for the position of the diaphragms.
2. In hot weather pinholes in negatives taken by the wet process are often met with. Give in detail the reason of their formation, and a cure for the evil.
3. State how you would prepare a gelatine emulsion in hot weather, giving all the precautions you would adopt to prevent decomposition of the gelatine.
4. Give an outline of the platinotype process. State anything you may know in the early history of photography regarding the use of the sensitive salt employed.
5. Give the theoretical reactions which result on the addition of ferrous sulphate and silver nitrate, and show how this applies to development by the ordinary iron developer.
6. It is desired to reproduce an etching by photo-engraving. What method should you adopt?
7. Give an outline (with formulæ) of a process for copying engineers' tracings.
8. Give the reaction that takes place when chloride of silver is placed in acidulated water with lumps of zinc. Has this reaction any practical value for photographers? Show how you could ascertain from the fluid (after the reaction has taken place) how much chloride of silver there was orginally.

Honours.

1. You are away from home, with your camera and gelatine plates, but have forgotten to take your proper lenses, but, by accident, find that you have a spectacle lens of focus adapted for your camera. How would you use this lens to take pictures, seeing it is uncorrected? Give the theory on which you base your adaptation of the lens to photographic purposes.
2. Give your views as to the advantages and disadvantages of the use of iodide in gelatine emulsions. Give the arguments that have been used for and against its introduction into the emulsion.
3. The sun is photographed with a lens of short focus, and halation is very marked. Sketch the form the halation will take, and give the reason of the phenomenon. Will there be any difference in the halation where glass of ¼ inch thick is used instead of glass ⅛ inch thick? If so, point out in each case where the halation will be strongest.
4. What is meant by a "reversal of the developed image," and to what causes is it to be traced? Give an outline of the experiments that have been made to prove that the causes you mention are the true ones.
5. Give the chemical explanation of intensification of a negative—1st, by cupric bromide, followed by the application of a solution of silver nitrate; 2nd, by mercuric chlroide, followed by ammonia. State the drawbacks, if any, to each method.
6. Suppose you had to print from a negative on to a cotton fabric, what process would you adopt? Describe your mode of proceeding, giving a reason for each step.

Capt. Abney, in his report on the results of the examination, says:—"It would be well to impress upon the teachers that mere rule-of-thumb work is not everything. These technological examinations should prove of great service if they do as they ought to do—make mere manipulative skill go hand in hand with a practical acquaintance with those principles on which the science of photography is based."

The Examination of Last Year.

The questions set in 1880 are hereto appended.

Elementary.

1. How should you prepare a nitrate of silver solution for use with the wet plate collodion process? Give the formula you would use.
2. On coating a plate with iodized collodion, it is found that it flows badly, being too thick. How should you correct this fault, and give your reasons for using the means you suggest?
3. What is the use of the addition of (1st) acetic acid, (2nd) alcohol, to the ordinary iron developer for wet plates, and state what would occur to a negative during development if they were omitted?
4. What is the use of a preservative with dry plates, and give the construction of one which you may have employed?
5. You are required to prepare a plain paper print; give the plan on which you would proceed.
6. You have a single landscape lens and a doublet, which equally cover one size of plate; state which lens you would use for photographing an architectural subject, and give your reasons.
7. What is the use of a swing back in a camera, and how can it be utilised for landscape work?
8. Suppose you suspect the presence of free nitrate of silver (1st) in a transparent liquid, and (2nd) in an emulsion, how should you detect its presence in each case?

Advanced.

1. Give a formula for the preparation of a bromo-iodized collodion for use in the wet process, and state how you would proceed to test the pyroxyline you propose to employ.
2. Explain fully the use of diaphragms in a single lens, illustrating your answer by diagrams.
3. You are required to prepare a washed collodio-bromide emulsion. Give the method you would adopt, and the details of the preparation.
4. Describe any variation from the ordinary wet process which you would employ, in copying a plan in black and white lines, for the purpose of getting a negative from which to make a photo-lithographic transfer.
5. Describe any process you may have practised for obtaining a photo-lithographic transfer.
6. Sketch the apparatus by which you would demonstrate that ferric oxalate in solution is affected by light, and show how you would chemically prove that a certain gas is evolved from it.
7. Explain the theory of the ordinary alkaline development as far as you know it, and state what happens when such a method is applied to films containing (1st) the chloride, (2nd) the bromide, and (3rd) the iodide of silver.

8. What are the combining weights of zinc bromide and silver nitrate; when $Zn = 65$, $Br = 80$, $Ag = 108$, $N = 14$, $O = 16$.

Honours.

1. Range, in order of specific gravity, wood-naphtha, alcohol, ether, turpentine, and benzine, and state for what purposes they are used in photography.
2. Show how Quinck's theory of the formation of drops explains the development of the Daguerrean image.
3. Explain accurately the terms, equivalent focus, conjugate foci, focal length, and aperture of a lens, and state the law by which two lenses of equal equivalent foci can be combined to give a combination of shorter focal length.
4. What are spherical aberration, chromatic aberration, and astigmatism? State if any of these are ever an advantage in photography, and give the reasons for your answer.
5. Show by rough diagrams the sensitiveness of (1st) the bromide, (2nd) the iodide, (3rd) the bromo-iodide, and (4th) the chloride of silver to the different rays of the spectrum, and apply the information to show with what glass you would glaze your developing room window.
6. If you have to choose an actinometer for (1st) carbon printing, (2nd) for silver printing, state what form or forms you would choose, and give your reasons.
7. State how you would recover the silver (1st) from an old negative bath, (2nd) from waste silver paper prints, (3rd) from a hyposulphite of soda solution, (4th) from a gelatine emulsion, (5th) from collodion films.

The following works of reference are recommended for study by candidates:—"Researches on Light," by R. Hunt; "La Lumière," by E Becguard; "Philosophical Transactions, Royal Society," 1840 to 1843; "Scientific Memoirs," J. Draper; "Miller's Chemistry;" "Treatise on Photography," by W. de W. Abney.

Correspondence.

THE PERMANENCE OF SILVER PRINTS.

Sir,—I have read with much interest your article on the permanence of silver prints. It is a subject that has not received the amount of attention that it deserves; it does appear somewhat strange, in the present advanced state of photography, that photographers should go on producing pictures that are sure to become a dirty yellow in a comparatively short time. The more beautiful the tone of the photograph, the sooner it appears to give way. I do not know if you have observed that the older class of cartes produced in the earlier days (say fifteen or twenty years ago) are much more permanent than those produced now. My own opinion is that the prints are not sufficiently toned to ensure permanence, and that the demand for light brown tones has something to answer for in the fading of silver prints, to secure which, the practice is to print very light, tone little, and fix gently in the hyposulphite solution. Now the older workers in photography will remember the old process was to print deep, tone until the print was quite blue, and then submit it to a vigorous fixing in fresh hyposulphite—prints so treated, in my experience, being very permanent. I have some of the oldest cartes-de-visite which are remarkable for their permanence. I am sorry that I cannot say as much for recent productions.

I also think the albumen has something to do with fading. I do not like the compound with which albumenized paper is coated; the surface appears to be coated with all kinds of preparations, colour for tinting the paper, varnish, &c.

The value of a photograph ought to increase with age, and photographers ought to be able to supply their customers with fairly permanent pictures. We apparently still want a good printing process—something that will give the beauty of a good silver print with more permanence; and anything that can be done in this direction would remove what I believe every photographer has felt to be a reproach on our beautful art.—Yours sincerely, James Howie.

[In the old time, negatives were denser and more vigourous, a strong sensitizing bath being used with a highly salted paper. These circumstances no doubt tended to make the pictures more lasting.—Ed. P.N.]

"FOG IN GELATINE PLATES."

Sir,—I read with great interest and pleasure Mr. Otto Pfenninger's letter on removing pink or red fog in gelatine plates, a bugbear against which, as far as I know, none has ever conclusively found a sure preventive, and I have not seen any reliable formula for removing it. I made a point of at once trying Mr. Pfenninger's process on some negatives I much valued, but could scarcely print from at all, and can most unhesitatingly state that the result was a complete, clean, and in every way most successful removal of the transparent pink and red fog.

Mr. Pfenninger speaks of its greatly softening the negative; "almost too soft," he says. This I found to be the case literally, but I also found a mode of intensifying again; it has been found that, after clearing a negative to some extent from this pink fog by means only partially successful, on applying dilute liquor ammonia to reintensify, the red bugbear has again been developed to an annoying degree, rather proving that it is the ammonia which has much to do with its cause.

I find that after removing the stain by Mr. Pfenninger's method, and washing and draining the negative well, any degree of intensity may be obtained by immersing it in a solution of cyanide of potassium, about one-third of the strength of that used for wet plates; this plan I can safely recommend. I cannot close without tendering to Mr. Pfenninger my sincere thanks for giving to us such an effectual safe destroyer of "the red demon," and I am sure he deserves the best thanks of the whole photographic community.—Yours truly, H. A. H. Daniel.

AN EXPLANATION WANTED.

Sir,—I have recently experienced a somewhat strange accident with gelatine plates. Being on a tour in Thuringia, I had occasion to refill my dark slides, and then the door of the darkened room was opened for a moment; there were at the time six plates about, which might have been affected by the light entering. On developing I found that two were completely spoiled, and turned black; one was so affected as to leave only a faint trace of the image, and one had two impressions on it; the other two must have been covered, or were only very slightly affected.

I enclose a print of the one with double impression, the subject of the original picture being *Die alte Burg Liebenstein*, and the underneath part, as also the faint background of foliage part, and the part of modern house, pavilion on the left hand side of the picture, were on the plate, which has turned completely black, and were a representation of the Curhaus at Bad Liebenstein. Although these two plates were in a double dark slide together, an impression or copying in the dark slide cannot have taken place, as they were separated by a piece of black cardboard, and the position of the picture also shows that the plates must have been lying in such a manner that the plain or back part of plate 2 was lying next to the prepared surface of plate one.

I deem this sufficiently interesting to be communicated to you, and if you or your numerous readers can give me an explanation of the occurrence, I shall feel much obliged. I repeat, the plates were both undeveloped when the accident occurred. The plates used were by Swan, of Newcastle.—I am, sir, yours, &c., Emil Selig.

A GOOD TONE.

Sir,—Noticing in last week's issue of Photographic News the article on "Tone," I beg to say a few words on the formulæ we use. In looking through the Photographic News Almanac for this year, I noticed on page 71 an article on "Toning Baths" by H. Knight, in which a formula is given; and seeing that he had used this same formula for over ten years, we tried it. The result was we got much more beautiful warm purple tones than we had before. Since that time no other toning bath has been used in our studio. For the benefit of those who have not one of this year's Almanacs I quote the formula:—Into a pint jug put ½ drachm of precipitated chalk, then add two drachms of chloride of gold solution (one grain of gold to one drachm of water); now add one pint of boiling water; after standing until nearly cold, pour the clear solution into a dish, and begin to tone as follows: take the prints one at a time direct from the printing frame (or after being trimmed), and lay them face downwards in the solution, and when the red colour has nearly disappeared, take them and put them direct in the following fixing bath:—

Common salt	¼ ounce
Liq. ammonia ·880	5 drops
Hypo. of soda	4 ounces
Water	1 pint

After ten minutes' fixing, wash in the usual manner.—Yours truly,
Walker Bros.

DR. VOGEL'S EMULSION.

Sir,—Returning from an excursion I find the issue of July 29th of your valuable journal, containing the interesting contribution of Captain Abney entitled "Substrata." I am glad to see that Captain Abney is successful with the substratum I recommended, but I beg to correct a little error in his paper with regard to my emulsion. It is *not* prepared, as he believes, simply by dissolving gelatine pellicle in acetic acid. I could not recommend such an emulsion; it would be, indeed, as Captain Abney says, a terrible article to keep on a glass plate. Besides, a film of this emulsion would be soluble in water, and liable to leave the plate during development in spite of the substratum. My emulsion is a combination of a gelatine and *collodion* emulsion with about 30 to 40 per cent. of acetic acid in it, and a large quantity of methylated spirit, to give it keeping qualities, and to facilitate evaporation during drying of the film. The guncotton gives the latter more cohesion, and makes it quite insoluble, even in boiling water, so that the emulsion can be employed in the hottest season without danger of dissolution of the film during development.—Yours truly,
Dr. H. W. Vogel.

GELATINE V. COLLODION.

Sir,—As one who has wholly discarded the silver bath and collodion, would you allow me a few words in answer to Mr. Henderson? In the two letters on this subject last week, no mention was made in Mr. Henderson's figures with regard to the expense of collodion and bath. If any one will take the trouble to reduce his quantities, he will find Mr. Henderson has cut it so fine that it is simply ridiculous. For instance, the amount of collodion stated allows only 24½ *drops* of collodion for each quarter-plate, allowing nothing for evaporation whilst coating 128 dozen. Now I have tried to coat a plate with that amount, and I confidently say it is impossible. Next, I see the amount of silver is assumed to be two grains for each quarter-plate. Does any one suppose that quantity is sufficient? I know from experience that when I have made up a new bath with 10 ounces of silver it has been worked up long before I have used 128 dozen of plates. Next he gives us two *drams* of developer for each plate. I own I have succeeded in developing a quarter-plate with this quantity since reading Mr. Hendersons remarks, but my practice in general work was to pour out one ounce of developer for each double quarter-plate, and I thought myself very careful at that. But whilst cutting it so fine on the one side, he does not do ample justice to the other. First, with collodion and bath, he takes the cost of materials only, whilst with the gelatine he takes an average of all the makers; this, of course, including labour, of which nothing is said upon the other side. To have been fair, Mr. Henderson should have stated the quantities of silver bromide and gelatine required to make emulsion enough to coat 128 dozen of quarter-plates; in that case the balance would have been upon the other side. I do not make my own plates, and yet I find a considerable saving by using gelatine instead of collodion. In the first place, I only pay 18s. per gross for my plates. I am not going to use your pages to advertise the maker, but I will say that they are all that can be desired; they are not without their faults, neither are any of the higher priced plates, all of which I have tried in turn, only to be convinced that a good reliable plate can be made at a reasonable price. But, apart from the cost of the materials, gelatino-bromide saves me the cost of a dark-room assistant, and, above all, I have not been troubled with the distracting headaches to which I was subject when using collodion, and the comfort in working is not to be ignored. No plate-cleaning, no albumenizing of plates, no waiting while plates are coated and bathed, no fear that the plate will spoil while some fidgetty sitter is arranging herself before the glass. I can get rid of my sitters in one quarter the time, which is a great consideration in a season watering place, where the work must be done while visitors are here, and a number of important people are waiting. There is also the important fact that you can make negatives in a light that it would be impossible to work with if using collodion, and, above all, I have been much more successful in catching pleasing expressions since I have used gelatino-bromide plates; and last, though by no means least, the negatives require much less retouching. To sum up, I save by the use of gelatino-bromide plates money, time, health, and temper, and secure, as a rule, better results.—Yours truly,
G. Croughton.
Lowestoft.

Proceedings of Societies.

Manchester Photographic Society.

The Society held its sixth out-door meeting for the season on Saturday last, the 13th instant.

The party (not so numerous as might have been expected) proceeded from London Road Station to Whaley Bridge, then wandered by a field path (where several choice bits were encountered, including the farmyard of Mr. Morten) to the pretty little village of Taxall; but the rain descended in such torrents that operations were almost entirely suspended till the time to return. A strong desire was expressed by all present to again visit this delightful spot. To a substantial meal ample justice was done at the Whaley Bridge Station.

The next meeting will be to Manley Hall and Park on Saturday, the 27th. Tram-car from Piccadilly leaves at two o'clock. Members should provide themselves with tickets (free), which are to be had from the Hon. Secretary.

Thursday Evenings for Photographers.

At the meeting held on the 11th inst., Mr. **Debenham** in the chair,

Mr. **Cowan** suggested and explained a simplified way of carrying out Mr. H. Wilmer's method of calculating the apertures of stops.

Mr. **Henderson** suggested a method of taking vignettes with any tinted background, direct in the camera, by using two shutters, working vertically, midway between the lens and the plate; the upper shutter is arranged so as to cut off as much of the figure as is required, and the exposure is then made; this done, the under shutter is closed, the upper one removed, and the unexposed portion of the plate is exposed on the background. He also exhibited a negative intensified by Dr. Monckhoven's formula, which, after about a dozen prints had been taken from it, had in parts turned to a ruby colour.

Mr. **Cowan** said he had exposed a negative intensified by this formula to strong sunlight for six days, and could then detect no change in it.

Mr. **Haddon** produced two bottles, one containing a solution of a persalt of iron, and the other a solution of sulphocyanide of ammonia. When mixed, these two solutions form an intensely red colour; this colour Mr. Haddon proposes to use as a medium for filtering the light of the darkroom, by filling a chemist's show-bottle with it, and placing same in front of a gas flame.

Mr. Henderson produced a weak solution of iodide of potassium and another (also weak) of bichloride of platinum; these, when mixed, give a colour so like that given by Mr. Henderson's solution that it was almost impossible, either with the eye or by the aid of the spectroscope, to detect the difference between them. Mr. Henderson said that there was one fact in favour of his solution, that is, that it was one of the best wet-plate intensifiers known, and in fact in formed the basis of his enamel process.

Mr. Haddon had boiled his solution with hydrochloric acid, and no change in the colour took place; but nitric acid did affect the colour. He had not tried it as an intensifier.

Mr. Brown passed round a wedge-shaped glass cell for determining the depth of any coloured liquid necessary to give a safe light.

Mr. Henderson showed two oval masks, suitable for cameo work, cut with the same die, the inner one being cut from wet and the outer from dry paper; as the paper shrinks in drying, the inner one is slightly smaller than the other, and by this means much more perfect registration can be obtained than by using masks cut in the ordinary manner.

The following simple method of ascertaining the intensity of light was suggested by Mr. Henderson:—Expose in the camera in the ordinary way a tablet of phosphorescent paint, in front of which is placed a number of graduated tints; after exposure for a given time, remove to the dark room, and the number of the tints imprinted upon the phosphorescent tablet will indicate the intensity of the light. He also suggested that by looking at the sitter through the tints, the amount of exposure necessary to be given might be approximately calculated.

Talk in the Studio.

Royal Cornwall Polytechnic Society.—We call the attention of our readers to the fact that August 30th is the last day for receiving photographs for this year's exhibition at Falmouth. Particulars and forms of entry can be obtained by writing to Mr. William Brooks, Laurel Villa, Wray Park, Reigate.

Trapp's Albumenised Paper.—We have received some samples which are said to be tinted with a colouring matter, not subject to change or fade by the prolonged action of light. Exposure side by side with some tinted albumenized paper, which we had by us, showed that the tint of Messrs. Trapp's remained intact, while the colour of the other faded completely. The use of fugitive colours for tinting paper is to be deprecated, not that the tint is in itself a matter of much importance, but if a customer perceives that this has rapidly faded, he will naturally expect the picture to fade with a like rapidity. We have met with samples of tinted albumenised paper which became whitened by an exposure to sunlight for three or four hours.

New and Remarkable Photographs of the Queen and Royal Family.—Among the events of the week we have to record that our well-known townsman, Mr. Jabez Hughes, attended at Osborne by command on Thursday last to photograph Her Majesty and the other members of the Royal Family now visiting the Isle of Wight. A series of successful groups were produced. The photographs were taken in the beautiful grounds at Osborne, the natural scenery of which lends itself so readily to pictorial effects. The Queen is seated as if at a garden party, surrounded by the various members of her family—the Prince and Princess of Wales, the Princess Royal (Crown Princess of Germany) and the Crown Prince, the Duke and Duchess of Edinburgh, Princess Louise (Marchioness of Lorne), Princess Beatrice, and the younger Princes and Princesses forming the families of the Prince and Princess of Wales, the Crown Prince and Princess of Germany, and the Duke and Duchess of Edinburgh. The Royal party thus represents three generations, and consists of a greater number of the Royal Family in one group than have ever been photographed together before. The photographs were all taken by the instantaneous method, and are of much larger size than such portraits usually are. We congratulate Mr. Hughes on having been selected for this high and distinguished honour.—*The Isle of Wight Observer.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper and Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 2. On Sending Out Proofs; What I do, and Why I do it," to be sent in by the 1st Sept. No name need appear. For rules, see previous numbers of News.

H. A. Parsons.—We will forward it by post.

R. M. D.—The price is seven francs, and it is published by Gauthier Villars, 55, Quai des Grands Augustins, Paris.

W. E. D. J.—1. The picture is rather thin and weak, and would have been better if it had been less exposed. You have not selected a suitable time, as such a subject requires moderately intense sunlight, shining somewhat obliquely on the scene. If your half-plate portrait lens is a good one, which we doubt, you would get very good results by using it in the ordinary way, and there is no need to employ so small a stop. Look well to the possibility of light entering between the sliding parts of the lens, and line the tube with black velvet. Success is made up of a number of trifling circumstances, often unimportant individually, but in the aggregate all-powerful. Let us know how you get on. 2. There may be an opening for them as "photographic scraps," but we fear you would have to supply at a low figure.

Pyro.—1. The problem exactly as you put it is a somewhat difficult one. Undoubtedly the best course is to reproduce the negative by first making a carbon transparency, and afterwards copying this in the camera; but to gain the full advantage of this you must be an expert. The next best thing will be to whiten by mercuric chloride, and back the negative with mineral paper. A little black lead applied with a stump over the faint details will prevent their loss in printing. 2. It probably arises from imperfect washing.

G. S. M.—1. You may, and indeed must, vary the strength to suit special cases. No spirit is required, but it is well to dissolve the citric acid in the water before adding the pyrogallic.

A Constant Reader.—Full details are given in Captain Abney's "Instruction in Photography."

One Rather Afraid.—It is impossible for us to tell you if he resides at the address given. If, however, you communicate with the local police, they will no doubt make the enquiry.

Walter M. Malby.—The photograph was not enclosed in your letter.

E. D. G.—It is very likely that it may answer to do as you propose, but if a notable amount of resinous matter is present, some difficulty may arise. We certainly should consider the fusion method less trouble, as there is no necessity to wash the chloride; but if you have not a suitable furnace ready to hand, the case would be different.

R. Schmidt.—Your paper was a very good one, but we received thirty-five others, so that the selection was naturally difficult.

South Devon.—It is not worth your while to part with your lens, and obtain that to which you refer, unless you require one of a different focal length.

S. O.—The salt is insoluble in water, but it will dissolve freely in a strong aqueous solution of potassium cyanide, and it is intended that it should be dissolved in this manner. A solution of nitrate of silver mixed with enough of a strong solution of potassium cyanide to redissolve the precipitate first formed will answer the purpose equally well.

Hampden.—The apparatus costs about £25.

Nitrate.—If free from organic matter it is not darkened by exposure to light. You should reject the sample as far as the preparation of the bath is concerned.

Emulsionist.— The letter x does not signify any difference in general quality, but merely that the manufacturer has selected certain batches as being more likly to suit photographic consumers.

Gelatine.—The mischief you refer to arises from a prolonged heating of the solution.

T. Barber.—Much under-exposed.

L. K. Longport.—1. It would only be a makeshift, after all; and considering that you want to arrive at the goal rapidly, we would advise you to go to one of the best makers and have the right thing at once.

P. Smith.—1. It may be rendered quite impervious to water by being soaked in melted paraffin wax. 2. About six parts to one.

Jon.—You say that you have thoroughly studied the book; but your letter proves that you have only superficially scanned it. Read the third chapter carefully.

Charles.—1. The process appears to be almost forgotten in the present day, but admirable results were produced by it. 2. A gentle heat favours the reaction.

C. K. Dalton.—Thanks; in our next.

A. J. Melhuish.—Received, but too late for insertion this week.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1199.—*August* 26, 1881.

CONTENTS.

	PAGE
The Exhibition of Electrical Appliances	397
Green Fog	397
Photography In and Out of the Studio	398
By-the-Bye—Pawnbrokers' Bargains	399
Gelatino-Chloride-of-Silver Emulsion. By Captain W. de W. Abney, R.E., F.R.S	400
An Apparatus for Washing Prints. By M. A. S hurer	401
Note on Photographs of the Spectrum of the Comet of June, 1881. By Professor Henry Draper, M.D	401
Notes	402
Topics of the Day—Reception Room Notes: On Receiving a Sitter and Taking an Order	403
Photographing the Lightning. By Charles Kerfoot Dalton	405
On the Increase in Sensitiveness of Gelatino-Bromide Plates by Means of an Excess of Silver Nitrate. By Dr. Eder	405
Photographic Printing. By W. Cobb	406
Correspondence	406
Proceedings of Societies	407
Talk in the Studio	408
To Correspondents	408

THE EXHIBITION OF ELECTRICAL APPLIANCES.

The notable advance which has been made of late in the application of the electric force to industrial uses has followed principally on the introduction of the ring armature, the form in question being without doubt the best introduced up to the present time; this being true, not only as regards magneto-electric machines, but also for machines on the regenerative or (so-called) dynamo principle, and also for electro-motor engines. The armature in question, commonly called the Gramme ring or Gramme armature, was made by Professor Pacinotti, of Pisa, as early as 1860, and described by him in detail in the *Nuovo Cimento* for June, 1864. In this place the Professor accurately describes every characteristic of the modern Gramme machine as now constructed with one circuit for armature and field magnets, thus practically anticipating the (so-called) dynamo or regenerative principle as enunciated by Siemens and Wheatstone in 1867.

It is noteworthy that Pacinotti regarded his machine primarily as a motor, and mentioned incidentally its use as a generator, while Gramme some years after introduced the machine primarily as a generating machine, and electricians appear to have for some time lost sight of the fact that the ring armature machine might be used as a motor. So much was this the case that, about ten years after Pacinotti first constructed his machine, the fact that it could be used as a motor was annnounced as a new discovery.

At the present time by far the greater number of the machines which are in use for converting motive force into electricity, or for performing the inverse operations, are constructed with an armature based on that of Pacinotti; and considering that electric generators seem destined to play an important part in the future industrial progress of the world, it is but fair that justice should be done to Professor Pacinotti, of Pisa, as the inventor of the first magneto electric machine, giving a continuous current, and the first electric motor with a single armature, and having no dead points.

At present the arrangements of the Exhibition in Paris are very incomplete, but there is abundant matter to interest and instruct the student of electricity. Small electric motors suitable for driving lathes, sewing machines, ventilating fans, &c., are shown in abundance; the Hefner Altneck machine, as manufactured by Messrs. Siemens, being now made on a very diminutive scale for use as a motor, the height of some being no more than two inches and a fraction; while Trouvé's small motors are shown in great force, some driving toy boats, and others actuating miniature balloons, according to the system of Tissandier.

An electrical plough, which can perform the work of about twenty horses, is shown in action, and evidently excites much interest on the part of the spectators; while Achard's electric break, which depends on the simultaneous action of powerful electro magnets on every axle of a train, serves to illustrate an application of electricity which is likely to become of notable importance.

The secondary battery of Planté, as modified by Faure, is in active use in almost every section of the Exhibition, serving as it does to actuate innumerable small motors, which in their turn drive lathes, sewing machines, knitting machines, tricycles, and other pieces of mechanism, which only require a moderate motive force. One of the most interesting applications of the Faure battery is its use in supplying the current required for the Swan lamp, and we do not hesitate to predict that the Swan system of electric lighting will prove a keen competitor of many of the older and more complex systems.

An electrical tram-car runs to and fro between the Exhibition and the *Place de la Concorde*, the motors being manufactured by Messrs. Siemens; and the current is led from the exhibition by over-head wires mounded on posts. There are, however, at present, serious difficulties which will tend to hinder the adoption of electricity as a motive force for railways and tram-cars.

Other points of interest, including many matters of special importance to the photographer, must stand over for the present, as we intend to give a detailed account of the principal exhibits when the arrangements are more advanced.

◆

GREEN FOG.

There is probably no one of the ills that gelatine is heir to which has caused so much aggravation to dry plate makers during the past summer as green fog, and the aggravation has doubtless been all the greater for the fact that the cause of the trouble seems to be totally unknown. It would appear that all the coloured fogs which appear in gelatine plates are nothing but different degrees of the same phenomenon. Thus there seems to be no distinct line of demarcation between red fog, orange fog, and green fog, whilst opalescent fog seems to differ but slightly from these. They are all greenish by reflected light, and if intense enough, are all some red shade by transmitted light. We may, therefore, class them altogether under the name of "colour fog."

Colour fog would seem to be producible by either of two ways: the one by direct chemical action, such as excess of silver in emulsifying; the other by some atmospheric influence. In the former case, the fog is usually very dense, and distinctly red by transmitted light. There seems to be little doubt that it is produced by a combination between the nitrate of silver and the gelatine, which takes place when gelatine is allowed to remain for a considerable time in contact with the silver salt, and which combination is acted upon by the pyrogallol of the developer.

There is no doubt that red fog may be produced *without* an excess of silver in emulsifying, if the bromide be only slightly in excess; but it seems quite likely that in this case the cause is to be found in the imperfect mixture due to the viscosity of the gelatine, which may prevent the emulsification of the whole mass of the salts, and allow a certain proportion of the silver to be left free for a considerable time. We are the more inclined to adopt this view, as we have only noticed red fog occurring in emulsions where there is excess of bromide when the emulsification has been performed with the whole of the gelatine.

Colour fog from chemical causes can, however, always be avoided simply by having a sufficient excess of bromide, and according to the latest ideas on the subject this excess of bromide does not slow the emulsion; but the colour fog for which we believe no cure has been found as yet is that produced by some atmospheric influence. We say by some atmospheric influence, because although it almost always occurs during hot weather, it does not appear to be the direct result of heat, but to be due to some atmospheric condition which accompanies hot weather.

We believe that we are not exaggerating the fact when we say that no single commercial plate maker was able to keep quite free from the trouble during the past very hot weather, whilst some were issuing plates which gave a deep pea-green fog. Now there can be no doubt that some of these were working in rooms artificially cooled to a temperature which would have enabled them to produce perfect plates had it been the natural temperature of the air.

We tried the manufacture of several batches of emulsion during the very hot weather, for the sole purpose of attempting to find some solution of the green fog bug-bear, and these led us to form decidedly the opinion which we have given, namely, that heat is not the direct cause of the phenomenon.

We made an emulsion, first of all, without the use of any ice, the temperature of our dark-room being about 90° Fahr. Instead of attempting to let this set to wash it (an attempt which would, of course, have been vain), we precipitated the emulsion by means of alcohol, remixed it with water, and cooled our levelling-table with ice to secure the setting of the plates. This emulsion, we need scarcely say, exhibited a beautiful sample of green fog. We made another, keeping all the vessels used in the process cool with ice where required—that is, as nearly as possible fulfilling the conditions of colder weather—but the result was still green fog, although the plates were not useless. Again, we tried a still closer imitation of a cool day by keeping the whole room at a moderate temperature, whilst we performed all the operations of emulsifying, precipitating with alcohol, coating, &c. In this case we worked during the night, and reduced the temperature of the room to about 65° Fahr. by placing a large block of "Wenham" ice on a shelf near the roof. Still the green fog made its appearance. We have heard of similar experiences from commercial plate makers.

It will be seen that we can scarcely claim to have thrown any new light on the subject of green fog, and, in fact, our object in writing is principally to bring the subject prominently before our correspondents, in the hope that some of them may suggest a solution of the problem presented to them.

Can it be the electrical state of the atmosphere? We have heard this often suggested, but poor electricity has such a burden of phenomena otherwise inexplicable thrown upon its shoulders, that we are loth to add to it.

A slight amount of green fog appears to be quite harmless as regards the printing qualities of a negative. Mr. Cobb went so far as to state at a public meeting some time ago, that a negative exhibiting a slight amount of green fog is the one which prints best. This may be so, but we must confess that for our own part we are most pleased when we get an emulsion which gives plates showing no discolouration of any kind in the shadows of the resulting negatives.

PHOTOGRAPHY IN AND OUT OF THE STUDIO

The Cause of Sensitiveness of Gelatine Emulsions—Action of Nitrate of Silver on Gelatine Plates—A New Construction in Portrait Lenses—White Points on Emulsion Plates.

The Cause of Sensitiveness of Gelatine Emulsions.—We once more call the attention of our readers to Mr. Warnerke's observation regarding the sensitiveness of gelatine plates. He observed that a pressure on the gelatine plate before exposure had a very marked effect in diminishing the sensitiveness, but a pressure after exposure had no effect at all. In this connection we call to mind another fact, noted more than twelve years ago by Dr. Vogel, and confirmed by Gisard and others, that a pressure on an ordinary wet collodion plate has the opposite effect. In development the pressed part is blackened, as if it were affected by light. But no one would gather from this circumstance that the action of light is merely a pressure or anything similar. We here mention another fact published by Dr. Vogel. A solution of pyrogallic acid poured on an ordinary collodio-bromide plate diminishes the sensitiveness of it, though pyrogallic is recognised as a sensitizer: but if the solution is evaporated, the sensitiveness is increased in a remarkable degree. Vogel explains this by the circumstance that the plate in a wet condition is much more transparent than after drying, and therefore the light rays go through the wetted plate without being absorbed, and it is a general principle that only those rays which are absorbed exercise an action on the plate. It seems to us that Warnerke's observation may be explained in a similar way. It is well known that ordinary paper will become more transparent by pressure, and the same may be the case with gelatine plates. The pressed parts are more transparent than the others, therefore the absorptive power for rays is diminished, and in the same degree the sensitiveness is affected. Eder says the supposition of different modifications of bromide of silver is not sufficient to explain the high sensitiveness of gelatine plates in comparison with collodion plates. He calls attention to the fact, observed by him, that in collodion emulsion the whole of the bromide of silver is converted into green bromide by the addition of ammonia, but that even these green bromide plates have not nearly the sensitiveness of a gelatine plate, but only 1-20th of it. He suggests an influence of the vehicle. This seems to be confirmed by the fact that gum-arabic gives emulsion of which the sensitiveness by cooking or by ammonia will not be improved in so remarkable a degree as in the case of gelatine emulsion. But, on the other hand, we must call attention to the fact that the colour of the bromide is not at all a characteristic of the high sensitive modifications of the bromide of silver. Stas mentions three different modifications of it—the flocky, the powdery, and the granular (the latter is the most sensitive of all bromides of silver), but he remarks especially that each of them exists in two conditions, or a white and a yellow modification. We are of opinion that the greenish bromide of silver (the colour is more yellow than green) formed in a collodion film by ammonia is not the same modification as the greenish bromide in our gelatine plates, and that gelatine solutions give the best conditions for forming the granular highly sensitive bromide.

Action of Nitrate of Silver on Gelatine Plates.—The fact communicated by Dr. Vogel and Stosch, that nitrate of silver is not only a sensitizer on collodion films, but also on gelatine plates, is now confirmed by Dr. Eder. Dr. Eder has observed that it is sufficient to put the gelatine plates in a silver solution with a quarter per cent. of nitrate, and he says that the sensitiveness was increased four times. But he observed also, like Dr. Vogel and Stosch, that the plates soon decompose, and after twenty-four hours they give dense fog. Dr. Eder hopes to find out some plan of improving their keeping qualities. We are very anxious to hear how.

A New Construction in Portrait Lenses.—All our portrait lenses made forty years ago are constructed on the Petzval principle. The only variation is the construction of Dallmeyer's patent lens; but, in general, this lens merely differs from the old Petzval lens in the position of the back lens, which has the flint meniscus on the back-side, whilst Petzval's lens has it in front. About two years ago, Voigtlander (the son) introduced a lens notably different from that of Dallmeyer. In his new lens the back combination consists of two lenses, which are cemented together; in the older construction they are separated. We don't know whether this new Voigtlander is in use in England. On the Continent Dr. Vogel has tried it, and recommends it. The front lens of this new Voigtlander system is identical with Petzval's. The renowned optician—now Dr. Steinheil, of Munich—gives us a new portrait lens different from all others which have been made. He calls the new lens Antiplanet. This new lens is composed of two achromatic convex lenses, both very *near* together, so that it is difficult to put a stop between them; indeed, the stop is put in front of the system, and this is certainly novel. Further than this, Steinheil asserts that both lenses of his new system have certain optical faults; but all the faults of the front lens are compensated or annihilated by the faults of the back lens, because the faults are in both lenses of the opposite character. Opticians will understand this. The new Steinheil system has been already tried by German photographers, and it is acknowledged that it has a greater depth of focus, together with the same actinic power, as the old portrait lens. We are informed that the construction is patented.

White Points on Emulsion Plates.—Dr. Vogel communicates a strange fact. It was observed by practical photographers who used his emulsion, that sometimes in development a number of white points like pinholes appeared. It was supposed that the failure was caused by the emulsion; but, on the other hand, it was observed that on a substratum of india-rubber fewer pinholes were observed than on a substratum of gelatine, mixed with chrome alum. In experimenting on the matter, Dr. Vogel observed that during development, air-bubbles appeared on the surface of the plate, and on all such prints; when they adhered, pinholes arose. After this observation it was easy to find a remedy. As the best, Dr. Vogel recommends to flow over the plate, before development, spirit or methylated spirit (containing about 70 per cent. alcohol); but to avoid fog it is necessary to dissolve in one ounce of this spirit, sixteen to twenty grains of bromide of potassium. It may happen that similar phenomena may also be observed on ordinary gelatine plates, and the above mentioned remedies may be recommended. Dr. Vogel writes that he treated one half of one of his emulsion plates with, and the other half without spirit, and that he observed no pinholes on the former, while on the latter there were dozens.

By-the-Bye.

PAWNBROKERS' BARGAINS.

Uncle loves not photographic apparatus; he cannot judge of its value. But for all that, do not suppose everything is a bargain that is picked up at the sign of the three golden balls. In our own experience, there is little to be gained by purchasing stray paraphernalia of an avuncular relative; there are now-a-days so many establishments of standing where second-hand apparatus may be obtained, with some amount of guarantee and trustworthiness, that if you have a definite want, and cannot afford to purchase the article spick and span new, still no necessity exists to resort to a general dealer. Nevertheless, there is an interest—we had almost said romance—in straying about among those nooks and corners in which the flotsam and jetsam of London life have been thrown, odds and ends stranded high and dry when the huge wave of prosperity has receded.

This is Drury Lane. It is not an aristocratic neighbourhood, but then, if you want quaint experiences, you must not search them in broad and fashionable thoroughfares. It is a fine day, and not only are the street and pavement full of wayfarers, but figures crowd the openings of the close brick courts that debouch into the Lane. Stout Irishwomen in bunchy skirts and plaid shawls across their strapping shoulders, who wear white frill caps over their unkempt hair, stand here in knots, and discuss household matters in a loud key; costermongers in well-worn cords and slouch caps, and long, white pipes, adorn the exterior of public-houses, whence issues a stale beery smell, all the more potent because it is a hot day.

The fine weather has its influence on a pawnbroker hereabouts. Had it been cold and frosty, he would have exhibited his stock of rusty skates; as it is, there is swinging over head a whole row of second-hand cameras. Here dangles one at 12s., next is one at 14s. 9d., a third is priced 25s. Moreover, in the window are some photographic lenses, but these are not easy to discover among the Dutch clocks and carpets, and concertinas, and cheap jewellery, and highly-painted pictures set out for the attraction of passers-by. Not a square inch of frontage is left uncovered by the heterogeneous merchandise, and even our relative's name is fairly covered up.

We enter and look at the stock. That there shall be no deception, the camera—fitted with a lens marked Shephard—is held up for our inspection. The lens is directed to the street, and we see Drury Lane turned upside down on the ground-glass. "Look at the colours," invites the shopman; and certainly the colours of the animated street are very striking. But there is no dark-slide, and this defect we point out presently. Our objection is very lightly estimated. "No, there is not; but the camera is quite complete, otherwise. You can easily get one fitted for eighteenpence. The lens, you see, is by Shephard, one of the best sorts in the trade."

We turn to a larger camera marked 25s. which our friend assures us is called half-plate size, because it will take a 10-inch plate. "There is no name on this lens," we say. "No, there is not; that is why it is so cheap; if it were marked, it would be worth double the money."

We ask the particulars of a lens—a very bright article covered with golden lacquer. It is priced 22s. 6d. It is marked Shephard, and, we are assured, "it is a bargain, as it has never been used." A glance is enough to convince us of this fact; not only had it never been used, but it was quite incapable of use. Another instrument, however, was a fairly good one (a portrait lens), and, no doubt, well worth the seventeen shillings asked for it; and the same may be said of two cameras which were really serviceable instruments, provided they did not admit daylight, and for which fourteen or fifteen shillings were asked. To sum up: a photographer experienced in lenses and apparatus might have got his money's worth here, provided he purchased things he wanted; but the chances were against any one else.

We proceed westward. Where St. Martin's Lane cuts Long Acre we turn off, and make our way to what is generally termed Newport Market. This narrow court is our destination, full of "general dealers" and cheap butchers. Drury Lane is an aristocratic neighbourhood compared to this. The thoroughfare is only a footpath, and, as most of the dealers have trays in front to display their wares, you can hardly get through the tortuous passage without jostling. There is a close, musty smell, that is very disagreeable. As a rule, the stock-in-trade is a right humble one. Here is a wooden wash-stand, its two back legs broken off, leaning against the wall for support; here an old tin fish-kettle so battered and rusty, it seems to have been picked off the dust-heap. Shells, pink and blue, and broken chimney ornaments, shabby bed hangings, rusty door handles, and a brass plate marked

"Morgan, tailor," catch the eye. Note this shop on the right, where an old telegraph instrument lies cheek by jowl with a pair of boots, some rusty keys, and a brass telescope, and observe the stout lady sitting in the passage on a Windsor chair, her arms thrown back in extreme lassitude. She does not care for a passing customer, but you may examine her stock, and welcome, if you like, buy or not buy; and sometimes you will find a serviceable bit of apparatus, cheap and good.

We have several reasons for remembering this establishment. Our first introduction, many years ago, was over a bottle of yellow liquid exposed for sale on the tray. "How much for this?" was our query. "Oh, that, with the chloride of gold?—say 3s. 6d."—a very good estimate, we found, of its true value. But some time after we were more fortunate. A lens, four inches in diameter, attracted our attention. A careful examination showed it was an instrument of value, and although the name of the maker was crusted over with oxide, we subsequently made out "Ross" distinctly enough. It was a landscape lens of twenty-two inch focus, and altogether a promising bit of property. "How much?" was our query. "Ten shillings," was the reply. "Can't you take eight?" we said. "Off with it, then."

But bargains of this kind are few and far between, and our experience is certainly against the purchase of lenses from unknown sources. We do not claim to be infallible, but, without drawing any hard and fast rule, we give our opinion for what it may be worth. Here it is: nine out of ten of the stray lenses you see are common French quarter-plate instruments, and should be valued as such. As a general rule, when the lacquer is bright and there are no signs of wear—say at the place where the cap fits—the lens is a "duffer." A lens-hunter may occasionally espy an apparently good lens in uncle's window, but in this case, as often as not, the lens turns out to be minus a glass, or a combination has been replaced by a watch-glass or a neatly-fitted disk of window-glass. We have even found the front combination replaced by the objective of an opera-glass.

In respect to "duffers," it is singular how the name of "Shephard" has been taken in vain in their manufacture, while Dallmeyer, Ross, and Grubbe are by common consent left alone. A genuine Shephard, as everybody knows, is a capital instrument, and it is, of course, for this very reason that lenses made to sell and not to work are marked with the name. But it will be found—such is our teaching, at any rate—that while a genuine Shephard bears no number, and is marked "St. James's Walk, Clerkenwell," the "duffer" is distinguished in most cases by a number, together with the words "Shephard's improved photographic lenses." We know of several "duffers" at this moment, all new and bright, and shining in appearance, which we have come to regard as landmarks in London. One is in a window not far from New Cross, a second in the Borough, and a third in Drury Lane. A good second-hand lens generally shows unmistakable signs of wear, especially where the cap fits.

In the case of French makers, it is usual to sign in pencil on the edge of the front combination. Some have names engraved on the brass-work as well, but as many "shopticians" in this country prefer to have their own names on the French article, the instrument, like a tooth-brush, is frequently marked to order. One can well imagine a novice ordering a lens from some West End "shoptician," who assures the customer that the instrument shall be forthwith put in hand, and made specially; the lens when it comes home, bearing "Snookes and Co." beautifully engraved upon the brass-work, while in pencil on the front lens is found the name of the real maker—Darlot.

At a pawnbroker's in the Hampstead Road we once saw marked up, "Splendid lens by Breveté, price 30s." It proved a fairly good lens on examination.

Shopman.—First-rate maker, sir; Breveté, sir—rare chance to get one of his lenses.

Ourselves.—Can't say I have heard of him; but what (referring to the patent marks) are these letters, "S. G. D. G."?

Shopman.—Well, sir, you see that Breveté is a sort of foreigner, a Frenchman, and that very likely is some title; most Frenchmen have titles or orders.

Ourselves.—Cash won't run to this lens by Breveté; what can you do cheaper?

Out came a drawer full of lenses in every possible condition—examples of lenses minus everything, from the pinion to the back flint. There was, however, a Dallmeyer 1B, glasses intact, but mount looking as if it had been in the silver bath a few times—bought for 7s. 6d.

Mistaking the name of the instrument, or its description, for that of the maker is not uncommon.

At the present time there is a double, or, as the French term it, "twin" opera glass ticketed up in the Strand, marked "by Jumelle," although the real name of the maker is on the glass.

The "At Home" next week will be "Messrs. Alexander Bros., in Renfrew Street, Glasgow"; the following "By-the-Bye," "The Ownership of the Negative."

◆

GELATINO-CHLORIDE-OF-SILVER EMULSION.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

During my absence abroad, I find that there has been some correspondence on the above subject. The two gentlemen who have contributed have made the subject more or less their own. But, as I have had "a say" in the matter, I may, perhaps, be excused for putting in my oar again. My belief is, that the silver chloride will eventually be found to be very nearly, if not quite, equal in sensitiveness to silver bromide; and this I base on observations made a couple of years ago, when I experimented with gelatino-chloride, using various developers (none of which, I may say, however, were satisfactory till I took up Dr. Eder's development). The image was present, but the fogging was often hopeless. The method that answered best was when two emulsions were prepared—one of iodide, and the other of chloride. When these were mixed in certain proportions, the chloride would be satisfactorily developed; but the theoretical value of the experiment had gone, since it might have been argued that the silver reduced from the chloride was merely deposited on the iodide which had been acted upon by light.* It may well be, as Dr. Eder suggests, as I have been working at the time of year when there are more ultra-violet rays in proportion to the blue rays than when he carried out his investigations, that the proportionate sensitiveness of the chloride is greater in my experiments than in his, and, most probably, this will account for the discrepancies between us. I may say that, where I use the spectrum, I always test the plates with the crater of the positive pole of an electric light as the source of radiation; and this being always of the same temperature, the same proportion of the various rays are invariably present.

I would also remind such of your readers who are interested in the subject, that, with certain classes of gelatine plates, more especially those made with hard gelatine, any iron developer has a very poor chance of showing its real activity. For instance, some bromo-iodide plates prepared during the hot weather of last month refuse to give anything except a very faint image with an iron developer, whilst with an alkaline developer they behave perfectly, and proper density is secured. Gelatino-chloride plates prepared with such a gelatine would inevitably appear slow if developed with ferrous citrate.

---

* To my mind this was not the case, as the liberated chlorine would displace the iodine.

Collodio-chloride is now occupying my attention, and I hope to publish something shortly on the subject. I mention this as Dr. Eder may think that I am trenching on his ground, since he is going to examine gelatino-chloride with excess of silver. The mention of collodio-chloride leads me to make a remark that what is usually called collodio-chloride is, in reality, that and something more beside. It will be seen in all the formulæ given for printing by Simpsontype, that citric acid forms an important part.[*] It may also be remembered that fuming with ammonia gives vigour. I should like to point out that silver chloride alone will rarely give a print at all after fixing, but that it is the reduced oxide of silver from the citrate of silver which, in reality, gives the image. The fuming aids the conversion of the citric acid and silver nitrate to the form of citrate of silver. To experiment with this kind of collodio-chloride is almost useless, since the pure chloride is a much better substance to attack.

In your number of August 5th I gave a new form of developer. I should like to add that it appears to keep much better than ordinary ferrous oxalate, and that there is no sign of crystallization taking place in some that I prepared more than a month ago. I have some experiments in hand regarding its use with gelatino-bromide plates, and hope to find it a useful adjunct to them.

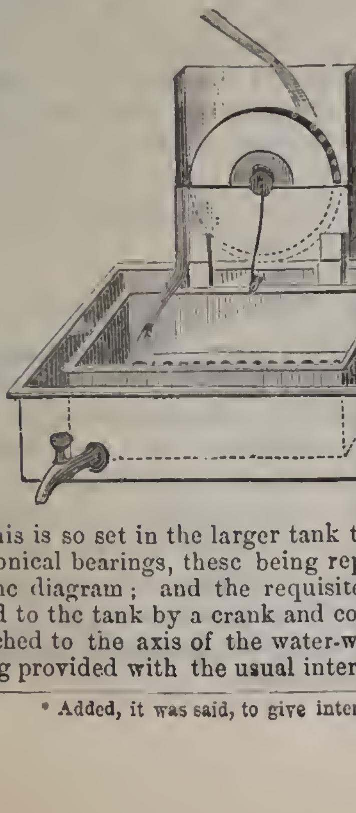
One word more regarding Dr. Vogel's letter which appeared in your last. I stated in my communication on substrata that an emulsion after Dr. Vogel's plan might be made by following out the directions I gave. Dr. Vogel objects that his plan is to dissolve collodion and gelatine emulsion together in acetic acid. The addition of the collodion emulsion is no doubt better, but I think, in his patent specification, he *also* claims to dissolve gelatino-bromide pellicle alone in acetic acid; and it was to this I referred. This method is worth a trial, particularly in hot weather, since there is no trouble in getting a plate to set and dry; and certainly dust is much more innocuous to the acid film when drying, than when the gelatino-bromide is prepared in the ordinary way.

◆

AN APPARATUS FOR WASHING PRINTS.

BY M. A. SCHURER.

A small overshot wheel is actuated by a stream of water as shown in the drawing; and the spent water is led by an out-flow pipe into a rectangular tank having a perforated bottom.



This is so set in the larger tank that it can rock freely on conical bearings, these being represented on each side of the diagram; and the requisite motion is communicated to the tank by a crank and connecting rod which are attached to the axis of the water-wheel; the outer vessel being provided with the usual intermittent syphon.

The prints, previously rinsed in order to remove loosely adherent hyposulphite of soda, are placed in the inner or perforated tank; and the water being turned on, this tank is kept in continual motion. When it becomes filled the syphon shown at the right hand side of the figure comes into action, and the whole of the water is rapidly drawn off, after which the vessel soon becomes once more filled.

The rocking motion communicated by the water-wheel serves to effectually prevent the massing together of the prints, and ensures a very rapid elimination of the hypo. —*Deutsche Photographen Zeitung.*

[A similar apparatus, designed by Mr. England, is figured in the forth-coming book on Silver Printing by H. P. Robinson and Captain Abney.—Ed. P.N.]

◆

NOTE ON PHOTOGRAPHS OF THE SPECTRUM OF THE COMET OF JUNE, 1881.

BY PROFESSOR HENRY DRAPER, M.D.[*]

The appearance of a large comet has afforded an opportunity of adding to our knowledge of these bodies by applying to it a new means of research. Owing to the recent progress in photography, it was to be hoped that photographs of the comet and even of its spectrum might be obtained and peculiarities invisible to the eye detected. For such experiments my observatory, was prepared, because for many years its resources had been directed to the more delicate branches of celestial photography and spectroscopy, such as photography of stellar spectra and of the nebulæ. More than a hundred photographs of spectra of stars have been taken, and in the nebula of Orion details equal in faintness to stars of 14·7 magnitude have been photographed.

It was obvious that if the comet could be photographed by less than an hour's exposure, there would be a chance of obtaining a photograph of the spectrum of the coma, especially as it was probable that its ultra-violet region consisted of but few lines. In examining my photographs of the spectrum of the voltaic arc, a strong band or group of lines was found above H, and on the hypothesis that the incandescent vapour of a carbon compound exists in comets this band might be photographed in their spectrum.

Accordingly, at the first attempt, a photograph of the nucleus and part of the envelopes was obtained in seventeen minutes on the night of June 24th, through breaks in the clouds. On succeeding occasions, when an exposure of 162 minutes was given, the tail impressed itself to an extent of nearly ten degrees in length.

I next tried, by interposing a direct vision prism between the sensitive plate and object glass, to secure a photograph which would show the continuous spectrum of the nucleus, and the banded spectrum of the coma. After an exposure of eighty-three minutes, a strong picture of the spectrum of the nucleus, coma, and part of the tail was obtained; but the banded spectrum was overpowered by the continuous spectrum.

I then applied the two-prism spectroscope used for stellar spectrum photography, anticipating that although the diminution of light would be serious after passing through the slit, two prisms, and two object-glasses, yet the advantage of being able to have a juxtaposed comparison spectrum would make the attempt desirable, and, moreover, the continuous spectrum being more weakened than the banded by the increased dispersion, the latter would become more distinct.

Three photographs of the comet's spectrum have been taken with this arrangement with exposures of 180 minutes, 196 minutes and 228 minutes, and with a comparison spectrum on each. The continuous spectrum of the nucleus was plainly seen while the photography was in progress. It will take some time to reduce and discuss these photographs and prepare the auxiliary photographs which will be necessary for their interpretation. For the present it will suffice to say that the most striking feature is a heavy band above H which is divisible into lines, and in addition two faint bands, one between G and *h*, and another between *h* and H. I was very careful to stop these exposures before dawn, fearing that the spectrum of daylight might become superposed on the cometary spectrum.

It would seem that these photographs strengthen the hypothesis of the presence of carbon in comets; but a series of comparisons will be necessary, and it is not improbable that a part of the spectrum may be due to other elements.

---

[*] Added, it was said, to give intensity to the image.

[*] *American Journal of Science.*

Notes.

A specially prepared paper is recommended by Pannington for protecting silver articles from the tarnishing action of sulphurous vapours in the air.

A moderately dilute solution of caustic soda is partly saturated with oxide of zinc, and after the paper has been soaked in this it is dried.

Such paper would certainly be useful in packing dry plates, as it is well known that volatile sulphur compounds exercise an injurious influence.

Gelatino-bromide workers must not forget that some samples of white paper are so phosphorescent as to ruin plates if brought into contact with them after recent exposure to light; and as the extent to which bodies are phosphorescent depends on very minute physical differences, we were hardly surprised to find a few sheets of paper in a ream, which were, for plain white paper, very strongly phosphorescent, while the bulk was not above the average.

The results of some of our experiments in this direction were detailed in a leader which appeared in July of last year; but since that time we have met with a sample of enamelled paper which, on exposure in the camera, absorbed sufficient light to imprint the high-lights of the view on a gelatine plate with which it was afterwards brought into contact. This is not to be wondered at, considering that the barium sulphate and gelatine used in enamelling paper are often highly phosphorescent.

Trial with a gelatine plate as described in our article does not afford nearly so delicate a test for phosphorescence as is attained by the use of Becquerel's phosphoroscope, but the former is a more satisfactory test from a photographic point of view.

A rough and ready test for the presence of alum in commercial gelatine. Dissolve four grains of alizarine in an ounce of water to which twenty drops of ammonia have been added. Gelatine containing alum takes a more decidedly red tint than pure gelatine when soaked in this solution, the colour inclining to yellowish brown when no alum is present.

The hard French gelatine usually contains alum, and should be avoided by those who wish to make Woodbury or carbon tissue, and to experiment with Warnerke's new method.

The manager of one of the largest photographic enlarging firms tell us that about half the negatives sent them are gelatine. Considering that the firm in question receives negatives from all parts of the world, we may take this as an approximate indication of the extent to which the gelatino-bromide process has come into use.

Dr. Eder's book on Modern Dry Plates is published to-day by Messrs. Piper and Carter.

The photographic *Chambre Syndicale*, in Paris, has come to an important decision. Technical examinations are to be held before experienced officers of the Chamber, for the benefit of assistants, and all who pass will receive a "diploma of capacity."

Photography has already taken the place of the village painter in some of the little Swiss churchyards, where pale-faced, lank-haired portraits of the deceased were common upon the upright boards that do duty for grave-stones. Photographs framed and glazed, and set round with white beads, are much more sightly than these hideous daubs, which, to mention an awful example, are seen—or were, some years ago—at their worst in Lungern churchyard, at the foot of the Brünig Pass.

In the same way it now bids fair to alter the style of the horrible little painted pictures met with by the way-side in the Tyrol, and, fortunately, nowhere else. The picture, about a foot square, is termed a "Votivbild," marking the spot of a fatal accident, and illustrating it. Sometimes it is a snow-drift with a dead man or woman, depicted with a good deal of circumstance; sometimes an unfortunate in the act of drowning; or, again, a waggoner crushed by his horses. As these pictures last forty or fifty years, there is scarcely a village or bridge that has not its lugubrious memento. Instead of the painting, a photograph of the deceased, surrounded by a black border, is now to be resorted to, it is said, and while wayfarers are thus still reminded of their mortality—obviously the purpose of the Votivbild—the aspect will not be so ghastly as the painted death-pictures.

The most startling example of the kind that we remember, is on the König See, a tiny lake in the Salz Kammergut, its bright blue water set like a jewel in the silver-grey rocks. Our frail boat was steered close under a jutting precipice; there was nothing to fear, possibly, but where the skiff almost touched the mountain wall, there hung, upon its face, no less than three of these terrible little paintings, quite enough to send any weak woman into hysterics. A series of harmless photographs might be substituted here with advantage.

It is likely that the Criminal Investigation Department will adopt the Bolas detective camera, or a modification of it, to aid in detecting crime. So many instances occur in which it is advisable to secure portraits of suspected persons without their being made aware that their conduct is under suspicion, that an effective instrument of the sort is exceedingly desirable. It is a moot point, however, what outward form is the best for a criminal detective camera. Mr. Bolas' first camera, as our readers know, took the form of a shoeblack's block, but the apparatus might be contained without difficulty in a basket, potato-can, tool-chest, or any other familiar street object.

An early "Topic" will be contributed to these columns "On Photographers," by a Sitter.

The new thermometers charged with a fluorescent liquid instead of ordinary coloured spirit look extremely pretty, and are very easy to read in the daytime, but fail a little in the case of gas or candle-light.

Mr. Norman Lockyer thus emphasises the great value of the camera to record lines in the spectrum which, without the intervention of the photographer, would never have been seen: "So that the sum total of this really very laborious inquiry with regard to iron was, that in the region between 39 and 40, the region including H and K on that map where, before the introduction of photography, scarcely any iron lines had been seen, and where only five solar lines, I think, had been mapped, photography gave us a total of nearly 300 lines in the solar spectrum, and it gave us sixty-two lines of iron."

"Ten times more sensitive! I have made plates twenty and thirty times as sensitive as collodion, I tell you!" The Scotchman listened unmoved. "Why," continued the enthusiast, "some of my gelatine films were over-exposed last winter when I took a moon-light picture—that will surprise you." Responded the Scot: "Nae, nae, yee'll no surprise me—I'm a liar mysel'!"

Topics of the Day.

RECEPTION ROOM NOTES: ON RECEIVING A SITTER AND TAKING AN ORDER.

BY THOMAS M. LAWS.

The reception room is now admittedly a very powerful adjunct of a photographic business, and all details regarding it ought to be the subject of great consideration, as it in a measure denotes the character of the establishment. There is great latitude in the style to be adopted, and it altogether depends upon the class of custom one is anxious to receive, how the room should be appointed. It is not so very long since—not a quarter of a century—when the studio itself, with a few notable exceptions, possessed all the requirements and accommodation considered necessary, when the artist himself received the sitters, suggested modifications in dress, posed, finished, and delivered the portraits. What an interesting record of our progress in this respect would we have possessed, had the series of "At Homes" now appearing in the News, been started with the first number in 1858! Reception rooms of the present day are considered of the highest importance, and in many cases the furnishings are most luxurious; they acquire fame as attractive lounges; the votaries of fashion pay tribute to the art collections displayed in the princely show rooms or galleries, and enrol their names in the engagement book as a pleasing pastime, a "happy thought."

With the great majority of us, however, such reception rooms are of no moment, and we must adapt our style to our wants. Some choose rather a business-looking office, with very little suspicion of its connection with photography; but it is not the most commendable. There should be a liberal display of the classes of work done; where the leading features are cartes, cabinets, &c., these ought to have prominence. The practice of crowding a lot into one frame is not good; a picture loses its individuality when so confused; rather have few and choice, interspersed about the room in small frames, showing examples of various poses with resources of scenic appointments. Specimens of larger work should also attract attention; a quiet tint and small unobtrusive pattern of wall paper, if paper be used, add considerably to the artistic appearance, while the pronounced, bold character of that seen in some reception rooms is highly objectionable. As the furnishings, &c., are so much a matter of individual taste, no special reference is needed any more than a passing hint to include something of interest—a small aquarium, for instance, a revolving album, an odd volume of *Punch*, and such like, which will be found useful on busy days if any waiting is necessary.

Undoubtedly, first impressions have more or less influence on us all, and on entering any business premises, we are in a measure guided in giving an order as much by the amount of confidence the attendants assure us of, as by the place itself. This we are all aware of, but are very apt to under-estimate its importance, and often wonder, when handling sitters in the studio, why they are at times so fractious, and betray tempers far from conducive to successful portraiture, while at others they are all obedience, and can be taken one after another with facility. A great deal of this is due to the treatment in the reception room; when the customer is first favourably impressed with superior business management, it is reflected in his whole behaviour afterwards. As a rule, a lady is deputed for this department, and, generally speaking, wisely so, for she can enter the many little details of dress, &c., that arise, with more appreciation than the sterner sex, although in some large establishments, where much practical business management is necessary, a gentleman may be more suitable.

As a rule, a sitter has a fair idea of the style of portrait wanted, and a mere practical suggestion on the part of the attendant is sufficient; but very often, by adopting an easy conversational manner, and by directing attention to styles likely to be admired, much further business can be pushed with greater satisfaction to both. Let there be no hurry in this respect, but let the final decision be noted, and then usher into the dressing room. The usual toilet requisites should be here at hand, and, with advantage, a little powder.

In sending sitters to the studio, it is advisable to have an easy means of communication; the ordinary speaking-tube, with whistles at either end, answers admirably. A code of signals might be adopted to save time—say one whistle for bust, two for full-length, three for three-quarter figure, or any that will easily suggest itself to suit the particular business. At very busy times, too, the attendant can facilitate matters by slightly classifying the sitters; before being sent up, for instance, two or three ladies requiring similar styles should follow in rotation; by this plan the general studio work is much lightened. Of course any irascible individuals should never be kept waiting, as they have a bad moral effect on the others.

In taking the order, there is great scope for an exercise of talent; it is here that much extra business can be introduced. This need scarcely be dwelt on, as no doubt it is extensively practised, but it must still be borne in mind that a great many people have very limited ideas of the capabilities of our art, and in taking the order it is the duty of the attendant to show her practical knowledge to advantage.

A ready-cash business is certainly the best, and should be more general in the profession; in practice it is very easily managed with mutual satisfaction. A receipt-book should be provided with the leaves numbered consecutively, and particulars of the sittings be written in the order of being photographed. Each leaf is in two portions, both numbered; on the half to be retained write Christian and surname, address, to post or call, style, quantity, and price. The receipt portion is in following printed form:—

No. 7,589 Central Photographic Studio
Washington
..............................1881
Received of Mr........................ the sum of..................
for..........................Photographs.
Paul Jones
Style

It is advisable only to enter original sittings in this receipt-book, as the printed consecutive numbers are used for the registration of the negatives. In taking orders for other work (enlarging, colouring, re-orders, and general miscellaneous), another receipt-book is necessary, which may, or may not, be numbered. As a full description of "How I keep my Books" has been given elsewhere, no further comment is here needed.

In concluding, there is just another point. In receiving sitters that require firm and, at times, delicate management, which is in the control of the numerous friends that occasionally accompany them, keep them well in hand, and on no account allow them to invade the studio to "help" the photographer.

BY FOCUS, JUNR.

Some photographers appear to attach only secondary importance to the amount of ability possessed by their representatives in the reception-room, to their suitability for the position which they hold, or it may be that "necessity knows no law" with them; that, in secret, like a well-to-do photographic acquaintance of mine, they somewhat Irish-like bemoan the fate which prevents them being simultaneously present in both reception-room and studio. Whatever the cause, certain it is that the post might in many cases be very advantageously filled by persons better adapted to its requirements.

Let us glance for a moment at the responsibility resting on these persons whose duty it is to first receive and arrange styles, prices, and general preliminaries with an intending client. Upon them devolves the duty of fostering and making firm that confidence which is necessarily wavering in many cases on a first introduction.

From them the customer first draws his or her inference of the capacity of the establishment, and first impressions linger long. The attendant must have sufficient of the lead of intuitive experience to accurately sound the depths of customers' pockets; and these soundings being ascertained, still it is far from policy to "run him ashore," to dispossess him of his last shilling; let his cool judgment return to him without the accompanying feeling that he has been "bled." There exists the art of retaining as well as obtaining a client. To be successful in the treatment of customers, Patience must pocket his dignity and descend from his monumental pedestal where Grief has traditionally usurped so vast a share of his animated facial graces; and Reason, the "gift of gods," must overflow the walls of intellect with copious surplus enough to wash out Passion's human taint. The levity of one class of sitter, who has come "for the fun of the thing," with an audience of half a dozen friends, has to be met with a gentle firmness calculated to suggest the advisability of a difference of department being exercised in a respectable house to what might be indulged in when visiting itinerant sixpenny positive concerns. It is somewhat provoking to perceive how slow some folks are in discovering that there is photography and photography.

On the other hand, an almost gushing amount of sympathetic confidence has to be indulged in for the edification of the nervous young lady, who, immediately after expressing herself desirous of being taken, assures us that "it is no use attempting, as she is sure to spoil the thing."

Don't, unless the reason is urgent, endeavour to effect much alteration in the decision of these sitters who have already some fixed desire, or it is only in accordance with a law in humanity that they should seek reason to declare, on seeing their proofs, that they were sure it would not be so good as if they had followed the dictates of their own choice.

Do not waste time in arguing with a client whom you are really convinced does not like his proofs; rather give him ready facilities for resitting; or the probabilities are, that you will shortly behold the smiling imprint of his countenance beaming on you from the specimen case of your nearest rival.

But there are some people incapable of forming an opinion for themselves, especially in the matter of their own portrait; they have to be led to a conclusion; not, however, with the mere sweeping assertions that the photograph is splendid, the likeness perfection, &c. The judgment must be judicious to be revered. A fundamental knowledge in portraiture should be acquired, enough to render it easy to grasp the really good salient points of a photograph; enough to—

> "Each small defect with regret descry,
> And mark the beauties with a raptured eye."

Even uncultured sitters are not slow in recognising a criticism that smacks of reason.

About booking. Take the sitter's order after he or she leaves the gallery. The operator may see reason to alter the previous arrangement, and as—well, customers are more tractable when they perceive that the execution of the order has commenced—have notices of the necessity of prepayment prominently displayed in the vicinity of the desk, and do not hesitate to draw attention to them if the hint is not otherwise taken. The address should be written in a day-book, especially dedicated to only such orders as have a negative taken at the time, and apart from such as duplicate and enlarging orders.

I think the numbers for the negatives should originate in the dark-room, especially where a large business is done. A packet of suitable slips of paper may be hung near where the plates are changed in the dark-slides; the assistant, with a lead pencil, can attach consecutive numbers to each slip, doing about sufficient at a a time to serve (say) a day. Then, when a negative is taken, it should have the number of the uppermost slip written on it with a diamond pencil, and this same slip can then be dispatched to the desk, per sitter or otherwise.

The number may then be transferred to the day-book, and the paper destroyed; or if it has been previously trimmed (the paper) the size of the negative and one end gummed, the book-keeper can re-write the number on it in ink, add the name and other particulars, then file, or otherwise preserve it until the arrival of the negative. Instead of scratching name on the negative, gum the edge of this paper to the bottom of it, and let it hang over the film, same as tissue paper is attached to photographs, only suspended from bottom instead of top. Advantages—the negative is protected from its earliest existence; there is no risk of them being mis-named, however numerous; and the number still remains scratched on, even if the paper should become displaced. The arrangement is not objectionable, but useful to the printer, the paper giving him ample room to tie off his number of prints, and assisting as backing. It is the most complete practical system I know of, forming a useful link throughout the process of photography.

Probably some of my notes are bordering on the province of the operator as well as the show-room assistant, but many of their duties are so intermingled, so identical, that separation is difficult; indeed it is highly essential, to achieve success, that a healthy understanding, a harmonious feeling should, exist, and actuate the course adopted by both operator and reception-room attendant.

The "Topic" next week will be "Vogel's Collodio-Gelatine Emulsion," by J. McGhie, Glasgow.

PHOTOGRAPHING THE LIGHTNING.

BY CHARLES KERFOOT DALTON.

IN reply to the request of our Editor, and also to numerous correspondents who have addressed enquiries to me, with reference to the photograph I obtained on the night of the 5th July, I have jotted down a few particulars that may possibly be of interest to some of my brother photographers.

The day in question had been excessively oppressive, and towards evening there were indications of an approaching storm. About half past eight there burst over Bolton and neighbourhood one of the most terrific thunderstorms that it has experienced (it was certainly the grandest I ever saw myself). Chain, forked, and sheet lightning, for over three hours, blazed continually, the sky being illuminated by streams bursting forth in several directions at once, streets and buildings being lighted up in a way that was magnificent and awe-inspiring. The constant succession of the thunder was deafening, peal after peal rolling across the skies. During the whole of the time the rain fell in perfect torrents, causing great damage in the town and neighbourhood. Railway communication was rendered impracticable for several hours during the early part of the following day.

A little before ten o'clock, one of the members of my family suggested to me the idea of taking a photograph of the lightning; I may say I had been thinking about the matter myself, my mind reverting to a photograph of a storm taken somewhere about twelve months ago by a gentleman whose name I am at the moment unable to recall.

Living in the heart of a large town, some difficulties presented themselves in the shape of getting a view with the least number of chimnies, my neighbourhood being very well blessed, or cursed, with several towering monstrosities belonging to adjoining works. I first attempted from the back-door, protected by a porch; but a gust of wind, accompanied by a small deluge, drove me from my vantage ground.

After some further trials, and drying the camera, I placed it on a table near to a window at the top of the house, looking directly east, towards which the storm was travelling. This was a decided improvement, the camera and lens being perfectly protected from both wind and rain. The sashes were, of course, thrown to the top, and the camera tilted considerably, the front being raised to the fullest extent in order that the greatest amount of sky could be obtained, and the chimnies reduced to a minimum. However, one of these

> "Tall bullies pointing to the skies,"

could not be conquered, but remains in the picture, decidedly the main object of attention, surrounded by a small group of flashes.

The plates I used were both Mawdsley's, their speed being fifteen to twenty times quicker than wet collodion. The first was inserted at 10.5 p.m. precisely, and exposed with the full opening of Ross's 8 by 5 rapid symmetrical lens until 10.20, exactly a quarter of an hour. A second plate was then exposed, commencing at 10.30 and terminating at 11 p.m. Just before closing the lens, the whole of the heavens were lit up with what I consider the most terrific flash of the evening, followed by a deafening crash of thunder. This flash is strongly delineated on the left of the photograph.

I at once proceeded to develop. The developer used was the one containing glycerine, made up to Mr. Edwards's formulæ exactly. The diluted solutions were used in the proportion of 4 drams pyrogallic to 16 drams ammonia.

The ammonia solution was flowed over the negative first, and returned to the developing glass containing the pyrogallic, the whole being again sent over the plate. I had only time to see the sky-line come up, when the film blistered up, and in endeavouring to remedy matters, I am sorry to confess, it was for any practical purposes destroyed. I must, in justice to the makers, state that the plate was an old one, and had been lying at the bottom of the plate-box for some months.

So much for my first experiment. The second plate (half hour's exposure) was then operated on. The proportions used in this case were altered to 6 drams pyrogallic to 16 drams ammonia, and these solutions were mixed before flowing over the plate. The image at once appeared, and developed like a well-exposed picture. After the whole of the flashes were visible by transmitted light, the remainder of the pyrogallic solution (10 drams) was added to the developer, in two equal parts, five drams, then the developer flowed on the plate, left in a short time, returned, and the remaining five drams added; the plate being left in the full strength of the developer about five minutes.

The whole of the time occupied in developing was about fifteen minutes. I have unfortunately made no note of the exact time, but speak from memory.

The negative has ten flashes distinctly marked, and the details in the slates of the houses, and flag staves about a quarter of a mile distant are visible.

◆

ON THE INCREASE IN SENSITIVENESS OF GELATINO-BROMIDE PLATES BY MEANS OF AN EXCESS OF SILVER NITRATE.

BY DR. EDER.

As a supplement to the investigations of Prof. Vogel and Stosch, recently communicated, Capt. Toth and I offer the following observations.

We have found that it is possible to still further increase the sensitiveness of bromide or bromo-iodide plates by treating them with either an alcoholic or an ammoniacal solution of silver nitrate. We employed various proportions of the silver salt, and found the most successful to consist of from ·05 to ·1 part of the latter dissolved in 100 parts alcohol. If a larger proportion than ·25 per cent. be employed, red fog is apt to make its appearance. The increase in sensitiveness due to this process appears to be some three or four-fold; plates so treated develop clear of fog with either pyrogallic or ferrous oxalate solution, and will, in the case of the latter, admit of even the addition of hyposulphite of soda without injury. The negatives are clear and full of detail, the colour being rather browner than under ordinary circumstances.

In experimenting with a solution ·15 to ·3 parts silver chlorate in 50 parts alcohol and 50 parts water, we found that the same results obtained as in previous cases, with the exception, however, that after twenty-four hours the plates, in spite of being kept in a thoroughly dry place, decomposed and gave fog on development.

We have observed, moreover, that it is possible to improve the keeping qualities of plates prepared with an excess of silver nitrate by treating them with an alcoholic solution of silver nitrate containing citric acid. From ½ to 1 part of a solution of 10 parts citric acid and 10 parts silver nitrate dissolved in 100 parts water is added to 100 parts alcohol, the solution filtered, and the plates allowed to soak in it for three or four minutes. After removal from the solution the plates should be well drained, and stood up to dry on filter-paper, taking care, however, that too much of the solution does not collect at the bottom of the plate, otherwise spots are apt to result.

Plates so treated will be found to be three to four times more sensitive than before, and, in addition, the development commences and proceeds more rapidly than usual. We found that such plates were quite good after forty-eight hours' keeping, and, no doubt, would keep longer. They have this peculiarity—that they give good intensity when developed with an old ferrous-oxalate solution rich in potassium bromide, which would be useless for plates prepared in the ordinary way.

If fumed with ammonia for five minutes immediately before development (a proceeding of great value for instantaneous work), there is an increase in sensitiveness, accompanied with the production of negatives of a more brilliant character.

PHOTOGRAPHIC PRINTING.

BY W. COBB.*

The method of silver printing as it is now almost universally carried on, with very slight variations, has been on its trial for more than a quarter of a century, and we generally find that where any particular process is worked, or any principle applied towards a given object, improvement results therefrom. Not so, however, with silver printing, for I do not hesitate to say that the work emanating from even our best studios is of a more evanescent character than that which was produced twenty or twenty-five years ago. This is to my mind a startling fact, and one which ought to excite our interest far more than it is, I fear, likely to do. We have within the last year or two almost entirely revolutionized our mode of work with regard to taking the negative, and it is high time for us to set to work, and rid ourselves of the stigma which attaches to us for pressing upon the ignorance of the public, and foisting upon them productions of such an unstable character as our silver prints are; we may be sure that our sins will find us out, and equally so that retribution will follow. We know for a fact that the public do not now purchase photographs, say of a miscellaneous character, with the same avidity which they manifested years ago, and the reason is obvious: how often do we hear the plaintive expression made use of by people, when turning over the pages of their albums, "What a pity they fade so!" And no wonder a feeling of disgust comes over one as the rows of pale, yellow, sickly remains of the once brilliant portraits of departed friends whose memory they were intended to perpetuate present themselves to view. I remember some time since talking this matter over with a brother photographer, who, more fortunate than myself, "had made his mark," as the phrase goes. He ridiculed the idea of permanent prints, remarking that "as they faded away, so it was thought necessary to replace them." However, I cannot but regard this as a short-sighted policy. People won't have their pockets trifled with beyond a certain limit, and quite right too. Another argument I have sometimes heard in favour of fugitive prints is this, that inasmuch as our work, as a rule, is so lacking in merit, it is a fortunate circumstance that photographs cannot long remain as monuments of our inability. Now this is, to say the very least of it, a most humiliating admission of weakness, and that, too, of a twofold character. Therefore I say, with these ugly facts continually staring us in the face, it is but reasonable that we should endeavour to regain the lost confidence of the public with regard to photographs by supplying them with such as we can at least guarantee as possessing the merit of permanency; then perhaps those amongst us who have the fear of permanency before their eyes will strive to attain to greater excellence in other directions. You will perhaps be inclined to say, Being so fully alive to the consequences of the evil you refer to, why do you not adopt a different mode of working in your own practice? My reply to this is, it is generally agreed to be a very difficult thing to put down any evil by individual efforts, which would be comparatively easy if attempted collectively. I may, however, in proof of my sincerity in this matter say that I have introduced the platinum process into my own practice, and I think I am justified in saying that it bids fair to prove successful. Many of my clients have expressed themselves much pleased with the results. I have brought a few exposed prints to-night to develop here with the view of showing you the simplicity of the manipulations, and if by so doing I can induce any of you to take up this very charming process and bring it to a commercial success in your own practice, I shall feel that the time has not been altogether lost this evening.

Correspondence.

ON THE PROPERTIES OF SILVER CHLORIDE IN GELATINE EMULSION.

Sir,—Dr. Eder seems to be firmly convinced of the necessity for my opinions being "untenable" and his own correct in any case—"heads I win, tails you lose;" at least, this is the conclusion one might well deduce from his last communication on the subject of my letters.

Those who have attentively read Dr. Eder's remarks as well as my own cannot fail to notice that Dr. Eder now practically agrees to the accuracy of my contention, though he misrepresents one of the main points of that contention in such a way as to make me hold an opinion exactly the reverse to what I really wrote in my first letter.

Let the reader turn to the concluding sentence in Dr. Eder's latest remarks, and note that there he states that his own and Captain Abney's views are identical, and that my "assumption must be regarded as untenable."

Now my "assumption" has been from the first that silver chloride (when silver bromide is fairly pitted against it) is less sensitive than silver bromide to the "red and yellow rays," or, as I wrote, to the "less refrangible rays." Dr. Eder combated this view of the case with the assertion that his experiments had shown there was no such falling-off of sensitiveness towards the red end of the spectrum as I had assumed. He entirely misses the object of my latest letters, which show that Captain Abney's experiments entirely support my "assumption," and turning round, asserts my position to be by these experiments rendered "untenable," while his own view requires no modification.

What, then, are we to understand? For my own part I confess I don't at all know what it is that Dr. Eder means. What I mean, and have stated all along, is this:—Firstly, that silver chloride is less sensitive in the camera than silver bromide, but not necessarily nearly so much so as Dr. Eder stated, viz., in the proportion of 1·60th : 1. Secondly, that one of the principal causes of the want of sensitiveness is due to an absence of even a moderate degree of sensitiveness to the less refrangible rays. If Dr. Eder is of the same opinion, we have been simply wasting words over the matter.

Turning now to the first part of Dr. Eder's communication, where he remarks that I would make it appear that he is doing an injustice not only to silver chloride, but also to myself, it is only here sought to turn the laugh against me by putting me in an absurd position. My object in writing in the first instance was to express my pleasure upon reading that Dr. Eder was engaged upon a subject in which I took much interest some years ago; and to record in your columns what I had previously done in another place—my views of the character and prospects of employment of the silver haloid under discussion. I do not claim to be the especial guardian of the fair fame of silver chloride; rather have I accorded to it a very secondary place. I might retort that Dr. Eder has shown himself jealous of my interference and presumption in having an opinion about the matter at all. It is not of an "injustice" to silver chloride of which I now and in my last two letters complain, but of a misrepresentation, and of an unnecessary, because proved groundless, all round refutation of the correctness of my views. If this does not form an "injustice" to me, at least it is only natural that I write with the object of defending my views against misrepresentation as well as the conclusions I draw from my experiments from being considered utterly untrustworthy.

Dr. Eder goes on to say that I am hardly right in quoting these recent "experiments" of Captain Abney "as proving the inaccuracy of his former investigations." A favourite maxim of mine is the homely one, "That which is sauce for the goose is sauce for the gander." Now Dr. Eder has already admonished me that I should not deduce conclusions too rigidly from the results given by one form of developer. Will he follow his own teaching? He may say that Captain Abney's developer is quite new. No doubt it is so to some extent, but then Dr. Eder states that hydrokinone is useless as well as the alkaline developer, which latter I have used. Now if I am to allow him to judge of silver chloride by the results given by ferrous citrate, he should do the same for me using the alkaline developer, or for Captain Abney, or any one else, using, say, hydrokinone.

If Dr. Eder will use a very mild developer, he has no right to attribute extreme insensitiveness to silver chloride.

---

* Read at Thursday Evenings for Photographers.

Dr. Eder's claim for the "priority of the idea" of using an alcoholic solution of silver nitrate for raising the sensitiveness is amusing, considering all that has lately been written in the journals upon the use of this solution upon bromide plates. I may mention that I prepared emulsion with excess of silver nitrate; but I am not in any way going to claim the "priority" of Dr. Eder's brilliant idea.

But I am getting into a bantering mood; and the object of this letter is fulfilled, viz., to disclaim the opinion Dr. Eder has attributed to me. I fully acknowledge and bow to Dr. Eder's superior scientific attainments, but none the less do I feel that I have a right to uphold my discredited views when proved correct, as well as to defend myself from misrepresentation, unintended though it may be.—I am, sir, yours faithfully, HERBERT B. BERKELEY.

COLLODION *V.* GELATINE.

SIR,—When doctors differ, who is to decide? I have no intention of analysing thoroughly the calculations either of Mr. Patricks or of "One of the Abominations;" but let it suffice to say that the difference between them is such as to warrant me in declaring that my estimate is in no way shaken. The fact that the latter gentleman pays 3s 6d. per ounce for his silver is a sure proof that he does not work collodion at its cheapest; and, moreover, he gives the price of dry plates at 20s. per gross. I gave an average of twelve makers' prices, taken from the price-list of one of the principal store-houses, at 1s. 10½d. per dozen. I think this is a fair average. I envy Mr. George Croughton very much regarding his wonderful luck in getting such uniformly good plates—"All that can be desired, and yet not without their faults." I am not at all surprised at Mr. Croughton being such a staunch advocate for gelatine plates, seeing that he required half-an-ounce of developer for every quarter-plate, and has just learnt that less than half that quantity is enough; and who cannot coat a quarter-plate with 24½ drops of collodion? As a fact, not more than 15 to 16 drops are required (without partly coating one's boot), and this any of your readers may test for themselves by taking a drachm measure full of collodion, and coating a quarter-plate, returning the surplus into the measure, carefully noticing the difference (15 drops).

I never knew a good and uniform operator who washed the silver from his plate previous to or during development, and this is evidently what Mr. Croughton does when he uses 1 ounce to a double quarter-plate. Doubtless Mr. Croughton is easily pleased—most artists are. Take Rejlander, Mrs. Julia Cameron and others. Who ever saw a clean photograph by either? It is an easy matter for your readers to take a given formula and calculate the actual cost of a batch of emulsion, and this varies somewhat according to the method adopted. One [quantity I made was as follows:—

Silver, 5 ounces at 3s. 1d...	... 15s. 5d.
Bromide, 3½ ounces at 4d. ...	... 1s. 2d.
Gelatine, 4 ounces at 3s. 6d.	... 0s. 10½d.
Alcohol, 3 quarts at 1s. 3d.	... 3s. 9d.
70 dozen glass at 3d. ...	... 17s. 6d.
	£1 18s. 8½d.

This coated 70 dozen quarter-plates. I know that many of your readers will take exception to the quantity, and say I should have coated 100 dozen. Of course there is coating and coating; if a very rapid plate is wanted, thicker coating is necessary, as the bromide is more transparent; to which must be added the cost of various extras, as per example—plant, interest on ditto, rent, taxes, water, ice, labour, breakage, fuel, failures, paper, boxes, gas, carriage, discount to dealers, repairs, depreciation, experiments; and last, if not least, advertising; and in addition there may be many other items unknown to myself. Take the question of labour, for example; one professional plate maker told me he paid his principal coater £5 a week, and that not on piece-work.

In conclusion, taking all the extras and risks into account, the wonder is that a good plate should be retailed at 1s. 10½d. per dozen quarter-plates. I, as a gelatine dealer, know that many have given up making plates on account of it not paying a fair return.—Yours respectfully,

A. L. HENDERSON.

PREPARING GELATINE PLATES.

SIR,—I now prepare my gelatine plates myself, and am very pleased with them. I observed that, by preparing about 500 grammes emulsion at a time, I obtained a beautiful quality of plate, which developed without fog, and, what is better still, it developed quickly, and the negative nearly always presented the aspect of a collodion plate by transparent light. As I succeeded so well in preparing my own plates, I one day made 1,000 grammes up, and was surprised to find the resulting negatives much softer than the previous ones; but I had to develop longer, and the general aspect was not so good.

On another occasion I made up 2½ litres, but these plates were very difficult to develop, and the red transparent fog appeared on every one when a drop too much of ammonia was used. I am obliged to use too much free bromide in the developer, and development goes on so slowly that it is very trying to the temper. I may state that I used every time exactly the same chemicals. I now prepare always at most 1 litre of emulsion. I had more than one gross of English special good ones through a dealer, and the whole batch has this last-named fault. It seems to me curious that manufacturers of years' standing did not find out that emulsion prepared in too large quantities is very difficult to manipulate. By developing plates slowly time is taken up, and when you are obliged to develop by a pyrogallol solution—1 to 150, instead of 1 to 400—the resulting negative may not possess the same quality. Perhaps some other gelatine dry-plate worker has found the same, and could confirm my observation.—Yours truly, OTTO PFENNINGER.

Proceedings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

THE annual meeting was held on the 9th inst., the Right Honourable the Earl of Rosse in the chair.

The minutes of the last meeting having been read and confirmed, the secretary read a letter from Sir Antonio Brady, expressing his regret at not being able to attend.

The following members were then elected:—Major John Richard Pearson, R.A., Messrs. Andrew Pringle, Wm. Adcock, J. W. Robinson, Junr., Edward James Jackson, and S. De Brath.

Mr. GLAISHER read his report on the pictures contributed by the members for the current year, and announced that the following prizes were awarded by the Council:—To Mr. F. Schwabe, for Nos. 4, 21, and 24, the first prize, consisting of a large silver goblet; Mr. W. S. Hobson, for Nos. 217, 222, and 223, a silver goblet; Mr. S. P. Jackson, for Nos. 1, 3, and 4, a water-colour drawing in frame; Mr. R. O. Milne, for Nos. 159 and 164, a large album elegantly bound in morocco; Mr. J. C. Hannyngton, for Nos. 13 and 14, a large album elegantly bound in morocco; Mr. T. R. Shervington, for Nos. 35 and 37, an oil-painting in frame; Mr. R. Murray, for Nos. 156 and 161, a water-colour drawing in frame; Mr. W. D. Howard, for Nos. 510 and 533, a silver goblet; Mr. W. Adcock, for Nos. 4 and 6, an album elegantly bound in morocco; Mr. S. Norman, for Nos. 2a and 3, an oil-painting in frame; Mr. J. L. Ranking, for Nos. 2 and 4, a large album elegantly bound in morocco; Mr. Arthur Hill, for Nos. 7, 21, and 23, a painting in frame.

Certificates of Honorable Mention were awarded to Mr. Stephens, Lord de Ros, Messrs. Beasley, Brownrigg, Ritchie, Leventhorpe, Leigh, Brook, and the Earl of Rosse.

After the award of the prizes, the chairman and Lord de Ros were obliged to leave, and the chair was taken by Dr. Arthur Farre.

Bolton Photographic Society.

A special meeting of the Society was held at the Baths on Thursday evening, the 11th inst., Mr. Thomas Parkinson in the chair.

The business of the evening was to fix the place and date of the annual outdoor meeting; and it was decided, after some discussion, that the meeting should be at Whalley, on Saturday, the 27th inst.

The Hon. Secretary (Mr. Dalton) then exhibited on behalf of Mr. Smith, of the Sciopticon Company, a new patent camera with double swinging back, and fitted with rising and cross motion, bellows body, and screw to focus. Mr. Dalton stated that the weight had been a special point in the manufacture, a half-plate camera, with six double backs, and stand, weighing under 5¾ lbs. The range of focus was from 2¾ in. to 6 in. in the quarter-plate camera; a greater range could be obtained if necessary, by using a folding base-board. The stand (Kennett's principle) was also very light and rigid. A photograph was exhibited, which had been taken during a gale of wind, to show that the camera had been free from vibration. The lens, single achromatic, was evidently a most efficient one. Negatives were shown which had been obtained with it, the exposures being both instantaneous and ordinary. Mr. Dalton bore testimony to Mr. Smith's remarks as to the usefulness of a single combination lens, and exhibited a few 8 by 5 negatives, taken during his holidays, with this class of lens, which called forth general praise. Ruby and orange gelatine tissues for the dark room lamp, and a novel and cheap dropping bottle, were included. The camera, stand, and lens, &c., were considered to be most useful instruments, and well worth the price charged. One or two members thought, however, the bulk of the camera might be further reduced without much detriment.

The meeting closed at 10 p.m., with a unanimous vote of thanks to Mr. Smith for his exhibit.

Thursday Evenings for Photographers.

At the meeting held August 17, Mr. W. Cobb in the chair,

Mr. Henderson exhibited a copying-frame and a pendulum vignetter, which will be described and illustrated next week.

The Chairman read a paper on "Photographic Printing" (see page 406).

At the close of his paper Mr. Cobb developed some excellent platinotype prints, and a discursive but interesting discussion followed.

Messrs. Ashman and Prestwich thought that if a surface could be given to the paper, either before or after printing, it would much improve the appearance of the prints.

In answer to a query, the Chairman said that the time required to print by this process was about one-half that necessary for the ordinary process.

Mr. Le Fevre passed round a plan of the London-and-North-Western Railway Works at Crewe, printed by a photo-lithographic process, at about one-twentieth the amount it would have cost if drawn by hand.

It was announced that, weather permitting, Messrs. Cobb, Henderson, and Wright intend making a balloon ascent for photographic purposes from Lillie Bridge Grounds on the 10th proximo.

Talk in the Studio.

An Instantaneous Picture.—It seems that Mr. Von Sothen, who resides on the other side of the Atlantic, wished to slaughter a worn-out mule, and he concluded to blow off the animal's head with dynamite. In the circuit which fired the charge was included an electric release for an extremely rapid shutter, the camera to which this was attached being focussed on the doomed animal. The result of this ingenious arrangement was a picture of a headless mule with a jet of blood spurting from its neck, and even the rope with which the animal had been tied stood bolt upright, not having had time to fall.

Plymouth Art and Industrial Exhibition.—A first class silver medal has been awarded to Mr. T. Prothoroe, of Wine Street, Bristol, for his painting, "Day Dreams," shown at this Exhibition. The picture gives the delineation of a lady in the costume of the time of Charles I. playing on a mandolin.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 2. On Sending Out Proofs; What I do, and Why I do it," to be sent in by the 1st Sept. No name need appear. For rules, see previous numbers of News.

Joseph W. Hopkins.—We will make enquires, but are by no means confident of success.

G. W.—The suggestion can not have been made seriously, it being well known that the substance in question is frequently present in commercial samples.

C. Norton.—They arise from the use of the Coignet gelatine. Considering everything, we should think that Nelson's "X opaque" would suit you best.

One in a Fix.—First with regard to your litmus paper. Slightly breathe on a slip, so as to moisten it, and then hold it some little distance over the open mouth of an ammonia bottle until the colour changes to a bluish tint, but do not expose it sufficiently to make it decidedly blue. It will then be in a condition for use in testing your bath, a drop of which should restore the red colour either slowly or immediately, according to the degree of acidity you require. If the fog does not arise from any of the causes enumerated in the work you mention, it may be due to ammoniacal fumes in the dark room. We should be inclined to build the studio against the end of the house, so that the light may be received from the N.N.W.

H. Ottaway.—We do not know the address, but it should be obtainable from some of the agents who supply the article.

Arthur Maddison.—It does not follow that the would-be canvasser intended to defraud you because you recognised the "sly, crafty rogue in his face," even though he did join a woman and three children just outside your premises. Whether the commission should be payable only on the completion of negotiations between the photographer and the club-agent, would of course depend on circumstances.

R. T. Patterson.—Thanks.

H. T. Byrne.—There is nothing of the kind better than the apparatus figured in our present issue, or something of a similar character.

W. Bradshaw.—The following has answered well in our hands, not only for this purpose, but also as a substratum for gelatine-bromide plates.

Gelatine	2 drams
Water	6 ounces

dissolve by heat and add—

Chrome alum	5 grains
Water	2 ounces

A Beginner.—Bigelow's album of lighting and posing would suit you, but we have a notion that the price is somewhat high. Any dealer in photographic materials can obtain it.

W. G.—Print fully, and use a carbonate of soda toning bath; allowing it to act till the tint is somewhat colder than you require.

Amateur Landscapist.—Like yourself, we are imperfectly informed regarding the arrangements, but no doubt further information will soon be forthcoming.

South Devon.—It doubtless arises from traces of hyposulphite remaining in the film.

C. J. Hill.—1. We prefer to use a saturated solution of alum for the purpose, allowing it to act for two or more hours. 2. It is highly probable that it arises from the use of a dirty glass, but we cannot form a decided opinion without seeing it.

Thomas Annan.—Received, and reserved for next week.

LOCAL PATENTS.

BY MESSRS. DES VŒUX AND COLTON.

Applications.

George Smith, of Southampton Buildings, Chancery Lane, "Improvements in Photographic Cameras, and in Supports for the same parts of which Improvements are also applicable to other purposes."

David Bogue and Benjamin Constant Le Moussu, both of the Strand, "A New or Improved Method of and Means or Apparatus for Preparing Drawing or Transfer Paper with a Tinted and Embossed Surface for use in Lithography, Photo-lithography, Photography, and Zincography, and in the Production of Raised Surface Blocks."

Herbert John Haddan, of Kensington, "Improvements in Photographic Apparatus."—A communication to him from abroad by Joseph Lefeuvrier, of Merdrignac, France.

Grants of Provisional Protection.

Captain J. Bailey Holroyde, of the Hollins, "An Improved Combination of Materials to be Employed in Cameras for Taking Photographic Negatives, whereby they are rendered flexible, and the use of the Glass is dispensed with."

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1200.—*September* 2, 1881.

CONTENTS.

PAGE
A Remarkable Actinic Phenomenon, and the Possible Existence of a New Metal "Actinium" ... 409
Landscape Lenses ... 409
The British Association ... 410
Reviews ... 411
Photography In and Out of the Studio ... 411
At Home—Messrs. Alexander Bros. in Renfrew Street, Glasgow ... 412
Notes ... 413
Topics of the Day—Vogel's Collodio-Gelatine Emulsion. By J. McGhie ... 415
Intensity of Image in Gelatine Negatives. By Capt. Abney ... 415
Henderson's Copying-Frame and Vignetting Pendulum ... 416
Odd Jobs. By the Author of "Looking Back" ... 416
Correspondence ... 418
Proceedings of Societies ... 419
Talk in the Studio ... 420
To Correspondents ... 420

A REMARKABLE ACTINIC PHENOMENON, AND THE POSSIBLE EXISTENCE OF A NEW METAL "ACTINIUM."

Some highly interesting and important investigations regarding the action of light on a pigment consisting mainly of sulphate of barium, sulphide of zinc, and oxide of zinc, have recently been published in the *Chemical News* by Dr. T. L. Phipson, a gentleman who is well known in the scientific world as an accurate chemical and physical investigator.

His attention was called to a gate-post, which had been painted with a newly-introduced zinc paint, the remarkable circumstance being that this post was dark in colour during the day, but gradually became white when night set in.

Having obtained some of the pigment which had been used in painting the gate-post in question, he analysed it, and found the following to be its composition :—

Barium sulphate	41·50
Barium sulphide	1·02
Iron protoxide	2·12
Zinc oxide	16·30
Zinc sulphide	37·44
Matter driven off at a red heat ...	1·62
	100·00

It appears that this pigment had been prepared by precipitating a solution of zinc sulphate with a solution of sulphide of barium, pressing the precipitate, and gently igniting with partial exclusion of the air. The product has a very pure and brilliant white colour, but on exposure to light it gradually darkens, until it assumes a deep slate colour, this change requiring a period of from twenty minutes to some hours. When, however, the slate-coloured product is allowed to remain in the dark, the white colour returns in two or three hours. A very remarkable circumstance in connection with this phenomena is the fact that ordinary white or greenish glass almost entirely intercepts the rays which exercise a darkening action on the compound. So far is this the case that some of the powder covered by a piece of ordinary window glass only takes a very light yellowish or fawn tint by exposure to sunlight for four to eight hours. When the insolated compound was carried into a dark room no phosphorescence was observable; but we are not informed whether Dr. Phipson tested it with the phosphoroscope, or by exposing a gelatino-bromide plate to its action. The pigment was tested for silver, and this metal was not detected, although traces of lead, arsenic, and manganese were found.

At the present time no other actinic body is known which will not darken under glass, or which has its original tint restored by darkness, although the circumstance that the effect of light on certain dry plates gradually diminishes or disappears by long keeping after exposure presents some analogy to the phenomenon now under investigation by Dr. Phipson. It was at first supposed that the darkening was due to the formation of the black sulphide of iron under the influence of light, this compound oxidising in darkness to the light-coloured protoxide; but the recent researches of Dr. Phipson appear to point to the presence of a new element which he provisionally calls actinium. However this may be, the action of light has been proved to cause a reduction, as when some of the darkened powder is divided into two portions, one being thoroughly protected from the air, and the other exposed, the latter alone whitens in darkness. It is remarkable that, while some samples of the paint retained their power of alternately darkening and becoming white for more than a year, that others ceased to change after a few months, or even in a shorter time, these latter settling down into a permanently white condition. It need scarcely be remarked that the zinc pigment will not darken inside the laboratory, the windows effectually excluding those rays which change it; and Dr. Phipson has found that air and water vapour exercise an analogous retarding action, so that when the sun is low, the action of light on it is less; and the same has been observed when the wet and dry bulb thermometers give readings not very different from each other. It would be interesting to try the action of the electric light *in vacuo* on the pigment.

In the presence of pyrogallic acid, the reducing action of light is much increased, the darkening action then proceeding under glass with a notable rapidity, and the dark tint thus produced is more lasting than when the simple powder is exposed to light.

The dark product can be more or less perfectly extracted from the insolated pigment by acetic acid; while the actinic constituent of the white modification of the pigment is insoluble in acetic acid.

The investigations of Dr. Phipson may lead to results of considerable importance from a photographic point of view, and we hope soon to have the opportunity of presenting our readers with an account of further progress, as there can be but little doubt that Dr. Phipson will continue his researches, and either isolate the supposed new metal, or prove its non-existence.

◆

LANDSCAPE LENSES.

It was known long before the advent of photography that a small aperture pierced through the door of a dark chamber would form an image of outer objects upon a white screen placed at some distance from the orifice in the chamber.

The image so produced, however, is not so vivid or defined as to recommend itself to the practical photographer. It is nevertheless possible for a skilful operator, armed with a camera whose lens is a spectacle eye, and with gelatine plates, to produce perfect photographs of the image formed by this simple lens. The lens most suitable for the purpose is concavo-convex, otherwise "meniscus." It must be fitted into a sliding tube, carrying a diaphragm in front, and having the concave side of the lens facing outwards.

In the early days of waxed paper and wet collodion, good landscapes used to be taken with simple plano-convex and meniscus lenses of this sort. At the time of which we write the exposure of the prepared plates was not so nicely poised as it is now-a-days. Ten minutes over or under exposure made little difference in the result. It was a leisurely old-world way of working in the field, and it had its advantages, as well as its grave defects.

The old processes and primitive lens had a way of ignoring clouds and atmospheric effects, while they faithfully registered broad facts in the landscape.

In using a small simple meniscus lens of long focus, the most perfect definition may be obtained with a moderately large diaphragm. The exposure need not exceed that of a wet plate taken with a single achromatized landscape lens of equal focus and greater illuminating power. The exact duration of exposure can only be determined, however, in either case by actual experiment.

In using a simple meniscus lens, it is necessary to find out the difference between its visual and chemical focus. The former presents the image to the eye of the operator sharp and perfectly defined on the ground glass screen of the camera. The image formed by the latter is invisible, and its focus must be determined by experiment. When this chemical or actinic focus has been found, it will prove correct enough for practical landscape work to register the difference between the two foci on the sliding tube of the lens. The difference so registered should be allowed in focussing a landscape. This defect, known as "chromatic aberration," is the chief weakness of the simple meniscus lens.

A very useful lens for small landscape work is the front lens of an ordinary "quarter plate" portrait combination. It has the advantage of being achromatised, and therefore its chemical and visual foci are coincident or identical. To render it available, the back lens must be removed, and replaced by the front lens. The concave side of the lens thus faces the object, and by employing Waterhouse's diaphragms in front it may be successfully used for views, outdoor groups, and portraits.

By a simple device, the same "quarter plate objective" may be so transformed as to cover a twelve by ten inch plate. In this case the combination must be made triplet by fixing a meniscus lens at the back of the centre diaphragms, midway between the two outer lenses. The focus of the triplet so formed will depend on the focus of the meniscus, together with the focus of the "objective." In the absence of more perfect materials, the meniscus may be formed by the union of a double concave flint glass spectacle eye, and a double convex crown-glass spectacle eye. These may either be cemented together with "Canada balsam," or placed together detached in a "true" setting of wood made to fit the inner tube of the lens. Whether cemented or not, the meniscus must be set "true" between the outer and inner lenses; that is, the meniscus must be placed at right angles to the optical axis of the combination.

The meniscus, so set, is placed between the lenses of the "quarter plate" with its concave side to the front.

Perfectly straight lines may be obtained with this triplet by fixing the meniscus in its exact position between the two primary lenses. There is a point between the two at which straight lines are formed. Should the meniscus be fixed too far forward, or too far back, the lines of the image will curve either inwards or outwards.

In all probability the resulting combination will not prove perfectly achromatised, but it ought to be near enough for practical purposes, without test for visual and actinic focus.

It is of course better for those who have the means to avoid makeshifts, and to invest in the best lenses in the market. At the same time, gelatine plates, and a little optical knowledge, may enable some struggling brethren to work wonders with the cheap lenses at their disposal.

The old single view lenses should again be taken up and used to advantage. If they do not cover the field quite sharply up to its edges, they may be stopped down and employed in landscape work when instantaneous exposures are not required. They may also be used for outdoor portraiture and for groups. As a rule, they will not yield straight lines, and for that reason cannot be employed for photographing buildings or copying maps.

◆

THE BRITISH ASSOCIATION.

The work of the fiftieth session of this Society was commenced on Wednesday, in York Museum, the Association having returned to the mother city to celebrate its jubilee.

The afternoon meeting was of a formal and business character, some new members being elected to the Council, and arrangements made with regard to the sections; the sectional presidents and vice-presidents appointed being as follows:—

Mathematical and Physical Science.—President, Professor Sir W. Thomson; vice-presidents, Professor J. B. Adams and Mr. T. Archer.

Chemical Science.—President, Professor A. W. Williamson; vice-presidents, Mr. F. A. Abel and Professor Thorpe.

Geology.—President, Mr. Ramsay; vice-presidents, Professor Prestwich and Professor W. C. Williamson.

Biology.—President, Dr. Owen; vice-presidents, Professor W. H. Flower and Professor J. S. Burdon Sanderson.

Department of Zoology and Botany.—Dr. Owen.

Department of Anthropology.—Professor W. H. Flower.

Department of Anatomy and Physiology.—Professor J. S. Burdon Sanderson.

Geography.—President, Sir J. D. Hooker; vice-presidents, Mr. Francis Galton and Mr. C. Wyville Thomson.

Economic Science and Statistics.—President, Mr. Grant Duff, M.P.; vice-presidents, Sir G. Campbell, M.P., and Mr. Heywood.

Mechanical Science.—President, Sir W. G. Armstrong; vice-presidents, Mr. W. H. Barlow and Mr. C. W. Siemens.

The attraction of the day was, however, the evening meeting in the great hall of the Exhibition Buildings, when Sir John Lubbock delivered his presidential address.

Sir John Lubbock reviewed, in a singularly lucid and terse manner, the scientific and intellectual progress made during the past fifty years, and incidentally touched on the principal causes of progress in the whole history of mankind, as related by written records, or deduced from a study of objects which have escaped the destructive influences of time.

When the British Association was instituted, biologists regarded plants and animals as having come into existence as we now find them, and they were blindly regarded as beautiful or wonderful; but the true meaning of their parts was in almost every case a sealed book, and one which few attempted to open. Now glimpses of the truth are beginning to reveal themselves. We perceive that there is a reason, and in many cases we know what that reason is, for every difference in form, in size, or in colour, for every bone and every feather—indeed, almost for each hair. The detailed study of biology has led to most important results, and will doubtless bring about further economic progress.

For instance, it would appear that the fluke which produces the rot in sheep passes one phase of its existence in the black slug, and we are not without hopes that the researches in which our lamented friend, Professor Rolleston, was engaged at the time of his death, which we all so much deplore, will lead, if not to the extirpation, at any rate to the diminution, of a pest from which our farmers have so grievously suffered. As regards descriptive biology, by far the greater number of species now recorded have been named and described within the last half century. Dr. Günther has been good enough to make a calculation for me. The numbers, of course, are only approximate, but it appears that while the total number of animals described up to 1831 was not more than 70,000, the number now is at least 320,000. Lastly, to show how large a field still remains for exploration, I may add that Mr. Waterhouse estimates that the British Museum alone contains not fewer than 12,000 species of insects which have not yet been described, while our collections do not probably contain anything like one-half of those actually in existence. The chemistry of the heavenly bodies has been laid open to us by the spectroscopic researches of Janssen, Lockyer, Miller, Huggins, and others; and the revelations obtained by the use of the spectroscope have actually taught us facts regarding the movements of the stars in space.

The invention of photography, and many kindred subjects, were next brought under review; and the enormous industrial progress which resulted from an appreciation of the modern doctrines of the mechanical equivalent of heat, and the correlation of physical energy, were discussed; and next in order came a review of progress in electrical science—the invention of the telephone and the microphone, and the possible utilization of such centres of motive energy as the Niagara Falls through the intermediary aid of electricity.

Progress is the characteristic of the present age. "The ancients," says Bagehot, "had no conception of progress; they did not so much as reject the idea; they did not even entertain it." It is not, I think, now going too far to say that the true test of the civilization of a nation must be measured by its progress in science. It is often said, however, that great and unexpected as the recent discoveries have been, there are certain ultimate problems which must ever remain unsolved. For my part, I would prefer to abstain from laying down any such limitations. When Park asked the Arabs what became of the sun at night, and whether the sun was always the same, or new each day, they replied that such a question was childish, and entirely beyond the reach of human investigation.

We wish that space permitted us to give a more detailed abstract of the presidential speech, rich as it is with matter for reflection and incentives to future action.

◆

Reviews.

MODERN DRY PLATES; or Emulsion Photography.

By Dr. J. M. Eder, Lecturer on Photographic Chemistry at the Imperial Technical Academy of Vienna, Hon. Member of the Belgium Photographic Association, &c. The English edition, edited by H. Baden Pritchard, F.C.S., late Hon. Secretary of the Photographic Society of Great Britain. (*London: Piper and Carter.*)

The following is the preface to this new edition of Dr. Eder's work:—

"Our task has been a light and pleasant one. To Mr. Horace Wilmer is due the credit of translating this little volume, and our own work has been confined to comparing authorities, and, in conjunction with the author, completing the annual so as to bring down its contents to the present day. In this respect the present publication may be regarded as a new edition of Dr. Eder's work in German.

"There is no need to present Dr. Eder to an English-speaking public. His name as an ardent chemist and indefatigable experimentalist is too well known in the photographic world to need any words of introduction; and we feel sure that all who peruse these pages will not be ungrateful for the opportunity afforded them. It is not merely Dr. Eder's formulæ for the preparation of photographic emulsions, nor his advice relative to the mixing of developers, excellent as they are, that will be found most useful; but rather the clear and succinct manner in which he places before hardworking photographers, and *dilettanti* disciples of the camera alike, the whole theoretical and practical history of photographic emulsions. Dr. Eder's research on gelatine alone—the method of testing its purity, its setting qualities, and its general adaptability for the plate working, as also the best plans for heightening or lowering its setting and melting points, of preserving it from decomposition and adding to its firmness or elasticity—this research, in itself, must have entailed many months of laboratory work, and is a trite example of the thoroughness with which he has completed his task. The alternatives of boiling and adding ammonia are discussed at considerable length, and so are the means at the photographer's disposal to increase or decrease sensitiveness. Failures and remedies are not forgotten; and last, but not least, Dr. Eder furnishes simple methods of analysis, with a knowledge of which even those possessing but very moderate chemical attainments should be able to undertake an examination of any emulsions they may purchase or prepare."

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Sharp Photographer—Eccentric Sitters—Photography and the Recent Weather—Photographic Lightning.

A Sharp Photographer.—Gentlemen engaged in the delicate and difficult task of taking plans of fortifications without the permission of the authorities will, if they employ a photographer, do well to haggle about the prices charged, so as to avoid suspicion. The arrest of the two Russian officers in Gallicia was brought about by a photographer, through neglect of this very simple precaution. The Russians, it is said, were sent to Przemysl, a town in Gallicia (stated to be the key to Pesth for a Russian army of invasion), to take plans of the place, and they ordered photographs of the town and neighbourhood of a photographer named Hermer. Hermer somehow suspected his customers, and asked a much higher price than the market value. As the officers made no remark, but cheerfully paid the price demanded, the photographer gave information, and the strangers were arrested. Had they only been provided with a "Detective" camera, they might have taken their own views, and no one would have been the wiser.

Eccentric Sitters.—Photographers, if they chose, could tell a good many droll stories about their sitters. A photographer in Detroit has lately been interviewed, and has given his experience of photographing negroes and Chinese, and his remarks give one the impression that there are many worse sitters than Sambo and Ah Sin. Of the first he says, "Negroes generally take well. One nice thing is that they will never tell you to work this way or that, but merely say, "Make me a picture." We have to be careful, though, about their noses. They are naturally inclined to turn up, and if we don't look out we may magnify them into perfect frights. A Chinaman sits well after you get him posed, but he is just like a piece of wood. If you try to turn his head a little, you have to turn his shoulders and chair, and the whole house (I might almost say) with him. Chinamen's eyes are just like glass. They seem to have no depth of colour, and reflect the light so that they just glare in the picture. The only good eyes I ever got from a Chinaman were those of a high-toned fellow who had a good position as steward on a yacht. One day he came wearing some huge blue spectacles. They had glasses on the side of the eye as well as in front. I told him it would never do, for I expected it would make just two big blotches in the picture. But he said they were part of his costume, and must go in. I peeped on the ground-glass screen, and could not see a vestige of his eyes through the glasses, and I thought I was in for a frightful picture. But those eyes took through the blue glass splendidly, and he was so pleased that he ordered a large number of the photographs. I have been thinking since of taking all Chinamen through blue glass." The same photographer calls sailors perfect sitters. He says he can go out of the room after he has posed them, and stay half-an-hour, and they will not stir a muscle nor wink an eye while he is away. This experience does not coincide with that of a friend of ours who in the old callotype days had to photograph a sailor. The day was dull, and a sitting of at least ten minutes was calculated for. Having made Jack quite comfortable, our friend left the studio, and returned at the expiration of the ten minutes to find, to his disgust, the sitter standing up with his hands in his pockets and pacing up and down the studio as though he were on the quarter deck.

Photography and the Recent Weather.—The protracted spell of wet weather following so close upon a period of intense heat must, in many cases, try the temper of photographers. Studio roofs, for instance, have suffered severely. The scorching July sun has dried up the woodwork and started the putty of the window frames, and well made must be the wooden studio which does not admit the wet. If we are fortunate enough to have a week of unintcrupted fine weather during the autumn, it would be wise to have the studio roof overhauled, as a succession of frosty nights, swelling the moisture within the cracks, will be certain to make bad worse. We have heard also of annoyances arising from damp affecting gelatine plates. Many dark rooms which can be used for storing gelatine plates during a dry summer are perfectly unfit for the purpose in damp weather. It is suggested that to be on the safe side the dry-plate box should be enveloped in felt or in an india-rubber casing, so as to prevent any possibility of damp. Certainly the dark room should never, unless exceptionally situated, be used for keeping the stock of dry plates. It is a better plan to have only sufficient for the day. As for the interference with the business of the photographer, from a pecuniary point of view, by reason of the wet weather, that goes without saying. It is, we believe, the experience of most photographers that the autumn is the most profitable time of the year. Why this should be we can scarcely say, unless it is that people having put off, as people will, the visit to the studio, endeavour to make up for lost time before the winter comes, and so rush in shoals. Be this as it may, a wet autumn is a most disastrous affair for the photographer, and for the sake of the prospects of the profession generally we trust that a change may soon take place.

Photographic Lightning.—Mr. Dalton's account of photographing a flash of lightning, which appeared in last week's News, recalls to one's recollection the fact that lightning can itself play the part of the photographer. The curious phenomenon by which a flash of lightning can photograph a picture on the skin of persons struck, and which phenomenon was first brought under the notice of the Royal Society many years ago by Andreas Poly, Director of the Observatory, Havana, does not appear to have been noticed by anyone since 1855, when the last instance was recorded. The alleged authenticated cases commenced with the observation of Benjamin Franklin, who states that a man standing near a tree which was struck by lightning had an exact representation of the tree printed on his chest. Half a century later four instances were brought before the Scientific Congress of Naples. In the first instance, a ship, lying in the Bay of Arniro, was struck, and on the back of one of the sailors was found the impression of a horse-shoe which had been nailed on the masthead; while on the breast of another were the two figures 4. 4, the *facsimile* of figures on a second mast. The third case was that of a young man on whose body was found the representation of a metal girdle which he had been wearing; and the fourth case was that of a lady living at Lugano, who was sitting near a window during a thunderstorm, and was struck by lightning. She herself received no injury; but on one of her legs was found the picture of a flower which happened to be in the path of an electrical current. The *Journal of Commerce* for Aug. 26, 1853, relates how the representation of a tree was impressed on the body of a little girl who was standing near the window; while in 1855—the latest case on record—M. Raspail stated that a boy, having climbed a tree for the purpose of robbing a bird's nest, the tree was struck, and the boy thrown to the ground, and on the body of the boy was found an image of the bird and the nest. For twenty-six years no instance of photographic lightning has been recorded, and the sceptical, in the absence of the evidence of their eyesight, may still doubt the possibility of such pictures.

At Home.

MESSRS. ALEXANDER BROS., IN RENFREW STREET, GLASGOW.

Glasgow is not only big enough to take care of itself, with its busy thoroughfares, broad streets, rapid tramways, fine theatres, and great public buildings, but it is sufficiently independent to lead the way and permit others to follow. Glasgow, in a word, has a life of its own, which is peculiar and inherent to the place, while many of its sights are the finest in the world. The shipbuilding on the Clyde presents a picture which has not its counterpart throughout the universe. The huge red skeletons of iron, the ceaseless clanging of the shipwrights, the forests of scaffolding, the busy haunts rapidly succeeding one another as you float down the queen of rivers, make up a sort of commercial panorama to be seen in no other quarter of the globe. Here at this yard it is that they build the biggest steamers in the world—barring the Great Eastern—huge craft capable of carrying a small township; and at the next, Messrs. Elder's, no less than six steel corvettes for the British Navy were not long ago on the slips at one moment, together with a score of other big ships.

Another, and not less pleasant, feature of the broad straight streets of Glasgow is its confectioners' shops. These are indeed a novelty to the Londoner, whose refreshment houses are either hot, odorous dining rooms, or beery taverns. The Glasgow pastrycook's, on the other hand, is a delightful place, where you may call for anything from a bun to a dinner of a dozen courses. At Lang's, a noted house in Queen Street, you may in the season take your choice of three hundred different kinds of sandwiches, and perhaps half as many drinks, from butter-milk at a halfpenny a glass to Green Chatreuse from the Monastery. Everyone helps himself to meat or drink—there are plates and glasses at hand—and pays, according to his own reckoning, as he goes out. "It wouldn't do in 'Merica," a Yankee friend told us.

Glasgow, in its pushing, business-like way, gives employment to a great many photographers. There are, perhaps, half-a-dozen studios in Glasgow that do good work, and are efficiently supported. The prices charged are, on the average, half-a-sovereign for a dozen cartes, and for cabinets, eighteen or twenty shillings. From this it will be inferred that the work performed is in every way sound and good, while so populous is the city, that a steady flow of customers may be depended upon. Of these busy studios, that of Messrs. Alexander may be taken as a favourable type. Their establishment, situated in a commodious building in Renfrew Street, gives one the idea of an exceedingly prosperous undertaking. It is nearly all carte and cabinet work ("we take as many cartes as ever we did," says one of the firm); but in a charming little gallery which Messrs. Alexander have annexed to their establishment they show specimens of carbon work, enlargements, and other specialities, as well as some very clever paintings. A study of a St. Bernard dog *couchant* is decidedly the finest photograph in this collection; the thick-set muscles and closely-matted hair rendered with roundness and vigour, being the very incarnation of strength and prowess. A vigorous portrait of Dr. George McLeod (an enlargement finished in black and white) is another picture to be noted, if only as an illustration of what bold and striking family portraits may now be produced by photography. As soon as the public begin to understand that they may rely upon the permanence of these pictures, which represent so well those they know or have known, the days of portrait painting (except in so far as town-halls and country museums are concerned) will be numbered.

A copy of Luke Fildes' humorous picture, "A Difficult Subject," in which half-a-dozen stout warders endeavour to hold down an obstreperous prisoner while he is being photographed, supplies a ray of humour to the gallery, although, as we have already told our readers, there never was a more docile and tractable sitter than the ordinary convict. We have seen a good many photographed, both in this country and abroad, and there is not a photographer in the kingdom who would not consider himself a fortunate man indeed if his sitters were only half as quiet and obedient as convicts are. However, Mr. Fildes' picture is both clever and funny, and Messrs. Alexander do well, therefore, to find it a corner in their gallery.

The wet collodion process is still recognised here; albeit gelatine is deemed an effective auxiliary. It is hard to throw away years of experience with the wet process, and, certainly, until one has grown thoroughly familiar with the exposure and development of gelatine, it would be unwise as well. The busy photographer is not like the landscapist or the amateur, who may have time and leisure to repeat his exposure, or to whom a failure now and again matters little. With sitters waiting their turn, and grudging even the quarter-of-an-hour or twenty minutes you require of them, there is only one end in view—to be certain that you take a portrait, and as good a one as you can. In these circumstances many photographers still seek help (it may only be now and then, but none the less do they require it) from the straightforward and satisfactory wet-plate process.

There are two studios here. The walls are painted dark brown, and, altogether, the shadow side is very dark. Mr. Alexander prefers that his sitter should be lighted so that one half be in deep shadow, and, when the high-lights are arranged to his satisfaction, then, by the aid of screens of white glazed paper, he lightens up the shadow of his model as far as he may deem necessary. The glazed side of the studios rises some twelve feet, the roof, also of glass, sloping but gradually. Mr. Alexander prefers unbleached linen for screening the light from the top, the same material being also employed, to some extent, at the side. But in that portion of the studio where most light is required in order to illuminate the sitter, the glass is bare, or, rather, it may be made bare if necessary. This portion is provided with a series of shutters, something like Venetian shutters placed on end, except that the shutters are much larger. They are, in fact, long canvas screens, about a foot broad, placed on end, their front (that towards the model) being white, and the back of drab, linen. These shutters reflect more or less light upon the model, according to the degree they are opened. As it would be inconvenient to have shutters six feet high, there is a double tier of them.

The backgrounds are very conveniently arranged. There are half-a-dozen grooves into which they slide, and, from an adjoining apartment, this screen or that one is slipped into the grooves. No space in the glass-room is taken up, and the sitter is in no way disturbed.

As we have said, the studios are what may be termed dark studios. Drab and dark brown pervades the apartments, and, at the camera end, it is probably dark enough to focus without a cloth. At a convenient spot, posted up where the photographer can see it, but where the sitter is hardly likely to, is a sheet of photographic studies by Mora, Sarony, Luckardt, and others, to serve as suggestions for posing, an idea that is certainly well worth imitating. A score or more of selected poses, kept thus ready for reference, cannot fail to be of use for improving a stiff model, and suggesting what may be done with an angular arm or an awkward leg, just as the model stands there ready to be depicted.

"The safest mode of travelling is acknowledged to be Alexander's first-class railway carriage," says a squib, in reference to a novel description of portrait which the firm recently brought before the public; and the idea is a very good one. Here, in a recess in the studio, is a first-class compartment, or, rather, the half or side of one, with three seats comfortably cushioned. The carriage, when photographed, is taken rather foreshortened, and, a suitable background being placed behind the practical window, the illusion is complete. It is better to take but two passengers; but three portraits may be secured with a good lens. It matters not how the passengers sit down, the pose is always good; and, as the head, shoulders, and arms rest upon the cushions, there in no need of head-rest A capital picture of Mr. and Mrs. Crowe (Miss Bateman) was secured by Messrs. Alexander in their carriage, and, indeed, the accessory lends itself to the depiction of groups without the least difficulty; a few rugs or shawls are the only adjuncts necessary. Some interesting pictorial photographs should be forthcoming from Messrs. Alexander's railway carriage; for we remember a series of French sketches—to wit: "En Wagon," "Love-making," "Picnicing," "The Recruit," &c.—all of which might be repeated in photography.

The "By-the-Bye" next week will be "Ownership of Negative." The following "At Home" will be "Herr Hofphotograph Jos. Albert in Munich."

Notes.

Captain Abney contributes an important paper this week, in which he not only gives reasons for preferring ferrous oxalate development, but also explains why so many obtain thin negatives by this method.

"The lady's developer" is the term applied to ferrous oxalate, on account of its non-staining propensity. It is certainly very agreeable to develop with clean fingers, and the property is one by no means to be disregarded.

We have just seen some Chilian photographs taken during the war, and representing several of the struggles between the Chilians and Peruvians. One of the pictures, upon a ten-inch plate, gives a realistic scene of a battle albeit the landscape is perhaps rather quieter than one would expect. In the plain below are seen the battalions in reserve, drawn up in closely-formed columns, while the guns can also be traced by their smoke, and even some trace of the fighting line be made out in the distance. If we can manage to secure battle photographs, the camera will indeed be useful to the historian.

In our portfolio we have several examples of war photographs; there is a picture of the Redan taken immediately after its evacuation by the Russians, the fort littered with dismounted guns, broken fascines, and fragments of shot and shell; a photograph of the Taku forts (China war, 1860) with the scaling ladders still standing, and dead Chinese warriors lying beside quaint guns and old-fashioned cross-bows; pictures taken during the Abyssinian war, the Franco-German war, &c.; but these Chilian photographs are the first attempts we have seen to depict a living battle.

Chamounix is very full just now. It is strange to find bright shops and active business-life mixed up with snow, mountains, and pleasuring, and still stranger suddenly to light upon familiar names among so much that is unfamiliar. Mr. William England's charming glacier scenes, and "Frith's Swiss Views," meet one here face to face, and hold their own among the works of Continental photographers. At the same time, it must be admitted that the huge pictures of Mont Blanc scenery, taken twenty years ago by Bisson Frères, are still unrivalled, both by reason of their dimensions, and also on account of the lofty points of view whence they are taken.

An attraction in one of the Chamounix shops deserves mention. Some large unmounted pictures (24 inches) printed in carbon by MM. Braun, of Dornach; are pressed against the glass windows in such a way that they are illuminated by the shop lights behind. Since the lighting up is very brilliant, the photographs show to perfection.

Before quitting the subject of photography in the mountains, there is an application of our art we should like to suggest to the Alpine Club. It is this. When climbing a peak it is not so easy to find one's way up, since the climber is so much under the shadow of the upper portion that he cannot see his direction. He has seen the way up plainly enough from opposite ere he started, but now the course is not so clear. Did he, however, possess a photograph of the mountain taken from the point whence he first examined it, the individual land-marks as he comes upon them could be recognised: the pointed rock, the patch of fir trees, the crystal glacier, the stretch of verdure would be passed one by one, and the mountaineer thus assured he was on the right track. In most mountain excursions you lose sight of the top as soon as you begin to climb.

In order to get through our programme for the year we must postpone our Scotch "At Homes" for a while, and pass on to a description of some of the more famous studios of the Continent. The establishment of Herr Albert, in Munich—who has done so much to perfect the collotype or Lichtdruck process—will be the first to receive attention.

We hope to give our readers a peep into most of the principal photographic establishments in Berlin, Vienna, Pesth, Munich, and Dresden.

The Report of the Paris Observatory for the year 1880 has just been published by the director, Admiral Mouchez. The great telescope was employed for the first time during last year for photography; the photographs of the moon are not, however, as fine as those of Rutherford, but will probably be soon much improved; several photographs of double stars, and even of nebulæ, were obtained.

At the Staff College, Sandhurst, where every officer desirous of serving on the staff of the British army passes two years in study, military photography has of late become a favourite subject with the students. Dr. Atkinson, F.C.S., is the official instructor in photographic chemistry at Sandhurst.

It is high time to say a word in deprecation of the custom which is becoming very general of making all sorts of additions to bromide emulsion. Of course, nothing can be learnt without experiment, and it is only by research that we improve our knowledge. It is not so much the experiment as the experimentalist, however, to which we object. His sole aim is to be an inventor or discoverer. Sometimes the substance added is only innocuous and does no harm, like a little gum resin, or a homœopathic dose of some strange salt. "It does not actually improve the sensitiveness of the emulsion," the modifier tells us modestly, but there are a hundred and one minor advantages it confers. So the modification is followed, and actually believed in for a time, until one day the photographer finds the simpler formula quite as good.

It is different, however, when the addition recommended is positively harmful. The experimentalist has made a rough experiment, or, perhaps, but a rough guess only, and communicates it forthwith. He has not succeeded, it is true; but he thinks others might, so he makes known his formula to float or to drown as it may. It will never worry him again, we may be sure.

"Let well alone," holds good in photography as in everything else. Yet there are restless spirits, especially among beginners, who are always hankering after some deviation from the trodden path. The less they know, the more eager are they to test and try. We had a note the other day requesting to know a new method for securing the gelatine film to the glass. Our correspondent had used silicate, chrome gelatine, and albumen, and found them answer; but was there no other way he could try? Obviously there were many other methods he could try if he chose—that of wiring on the film, for instance, might be one of them.

It reminds one of the correspondent who asked: "What good does it do to drop glycerine into the dipping bath?"

We spoke the other day of the tomb of "the author of Robinson Crusoe" in Bunhill Fields. Few of us who reside close to his shrine realise the vast popularity of Defoe, and how widely the story of "Robinson," as it is usually termed abroad, is read. But a German writer has pointed out that of all books in the world—save, perhaps, the Bible—that of Daniel Defoe's is the best known, while following it from afar is Cervantes' Don Quixote. Has any photographer, we ask, thought of securing a picture for publication of Defoe's simple monument?

No man is a prophet in his own country, and, therefore, there might not be a great demand for the photograph in this country; but if not, Germany, France, Italy, and especially America, would appreciate the work. At any rate, we have given our readers the hint and done our duty. To any man of taste, a variety of ways would suggest themselves of arranging the picture, and perhaps surrounding it with some "Old London" relics.

Topics of the Day.

VOGEL'S COLLODIO-GELATINE EMULSION.

BY J. M'GHIE, GLASGOW.

When in Berlin a few months ago, whilst on a visit to Prof. Dr. Hermann W. Vogel, amongst other things of interest to photographers I was fortunate enough to see a number of prints from negatives taken by his new emulsion process. These pictures had a delicacy of detail, brilliancy, and at the same time a beautiful modulation in the high lights which gave them a pleasing effect and an artistic feeling, and as he claimed for his process the rapidity of gelatino-bromide plates combined with the simplicity of manipulation of wet plates, I naturally confessed a curiosity to know something about their mode of production. The genial Professor, with his well-known courtesy, appointed an hour for me to meet him next day, at the Royal Academy, Kloster Strase. Punctual to the minute I found him awaiting me in his laboratory, or, more correctly, the largest one of three he showed me, fitted up with every convenience, and which could be converted into photographic dark rooms at a minute's notice. After giving instructions to several of his students who were engaged in making some chemical experiments, he conducted me into the studio. After arranging the lighting, &c., we adjourned into one of the dark rooms to prepare a plate; and as what I saw may be of interest to many of my *confrères*, I will endeavour to describe in detail, and as lucidly as I can. His process of manufacturing the emulsion is patented, and is now an article of commerce; I will therefore refrain from a description of it; suffice it to say, the principal solvent is acetic acid.

The Professor, taking a polished plate, coated it with a substratum of—

Pure india-rubber	... ...	2 grains
Chloroform or benzole	... ...	1 ounce

The above coating dries in a few minutes (a quantity of plates may be prepared and kept ready for use).

A non-actinic bottle containing the cold emulsion was placed in a vessel filled with warm water of about 120° F. until liquid. The bottle was well shaken up, and the contents filtered through a pellet of cotton wool placed in the neck of a glass funnel. The plate was then carefully dusted with a broad camel-hair brush, and the emulsion poured on; it flowed and evaporated somewhat slower than collodion. The excess was drained off, and the plate gently rocked. When the last drop at the corner set it was placed on a hot water bath (a square tin box filled with warm water) to dry, which occupied but a few minutes. A sure test of knowing when it is thoroughly dry is its freedom from smell of the acetic acid: it also loses its milk transparency, and assumes a rich creamy appearance with a matt surface. (*En passant*, I may say that the plates may be used in their moist state, but it is preferable, for various reasons, to use them dry.)

The test exposure of the first plate was made against a standard English gelatine plate (so-called instantaneous); the second, with 20 per cent. less exposure, was found to be more than sufficient. The three plates were developed together in a tray. The formula used by the Professor was the one recommended by Nelson, viz.—

No. 1.—Pyrogallic acid	... ...	1 ounce
Methylated alcohol	... ...	7 ounces
Distilled water	... ...	3 ,,
White sugar	... ...	1 ounce
No. 2.—Liq. ammonia. 880	... ...	4 ounces
Water	... ...	2 ,,
Bromide ammonium	... ...	1 ounce
White sugar	... ...	½ ,,

One drachm of each, No. 1 and No. 2, in 4 ounces of water. Under this developer the Vogel-emulsion plates came up, in appearance and rapidity, similar to the wet-collodion process; in fact, were fully developed by the time the outline in the gelatine plate was becoming visible. After development, they were passed through a saturated solution of alum, and washed. They were fixed in a solution of

Soda hyposulphite	... .	1 ounce
Water	... ...	5 ounces

The fixing took place rapidly, after which they were washed, dried by heat, and varnished. As one of the negatives, from over-exposure, was unduly thin before varnishing, it was easily intensified by using the well-known formula of a solution of mercury bichloride and potassium iodide.

The whole operations, occupying the time and resembling in simplicity wet plates, thus bearing out—to my mind, at least—practically all that was claimed of them by its author. I have enclosed for your inspection proofs printed from these negatives.

Lighting the Dark-room—a Hint.

Every dry-plate worker has found from experience that the deep ruby glass necessary to work very sensitive plates (epecially in a bright light) is painful, besides acting most injuriously on the eyesight. When on a visit to Dr. Leisegang, of Dusseldorf-on-the-Rhine, I saw in his laboratory a simple arrangement that might with advantage be adopted in all dark-rooms. Immediately above the developing bench (in front) is a window, some 30 inches in length by 20 inches in breadth, glazed with plain glass varnished with three coatings of Thomas' "liquid ruby" (which, by-the-bye, he has found from spectroscopical experiments to be the best medium for cutting off the actinic rays of light). From the top of the window, projecting downwards at an angle of 45°, is a strip of blue glass the length of the window, and about 7 inches in width; the combination of the two colours forms a dark purple tint, which gives a most agreeable rest for the eyes, without in any way interfering with the sufficient lighting of the dark-room from underneath.

The "Topic" next week will be "On Photographers," by a Sitter.

INTENSITY OF IMAGE IN GELATINE NEGATIVES.

BY CAPT. W. DE W. ABNEY, R.E., F.R.S.

Reference has lately been made in the columns of the News regarding some points in alkaline development, and personally it would have given me great satisfaction if notice had also been taken of ferrous oxalate development. There are hundreds who work at the former, and can give their opinion regarding it; whilst I believe that the workers with the latter are few in number, and, consequently, it requires more nursing and cherishing. It has been shown that a certain procedure (say of flooding a gelatine plate with ammonia and bromide solution before adding the pyrogallol) will give the best class of negatives; but we have not been told authoritatively whether it is better to wash a plate in water before applying the ferrous-oxalate developer, or to use the developer at once without any preliminary flooding. As regards any enlightenment in respect to this developer, I suppose it is only the few that are interested, and not the many. Why the many prefer the alkaline developer to the iron, I know not; but for the few I would offer the following remarks.

During hot weather, such as we had a month ago, it is almost impossible to make plates with the soft gelatine, and we have to give a greater dose of the harder specimens in order to render the process at all workable. All the batches of plates which I have prepared with the hard gelatine appeared to be imperfectly developable by the ferrous oxalate. The image came out very slowly, and, when finished, was inclined to be thin. I have already shown one cause of thinness; but there is another, also, which at first sight seems curious. It is a fact that with plates prepared with hard gelatine, if the oxalate developer be applied without first soaking them well in water, the image will invariably be thin, and the required exposure for a good picture will have to be prolonged. If a plate made with such a hard kind of gelatine be exposed, and half of it be allowed to soak well in water, and the developer be applied, it will be found that the half which has been well soaked will come up with perfect density (always supposing the plate to be capable at all of giving density), whilst the unsoaked half will remain feeble, and apparently under-exposed. In some negatives recently developed, I was annoyed at finding drop-shaped markings of greater intensity than the rest of the picture, and eventually I traced this to a few drops of water having spurted on the plate before the developer was applied. My old practice used to be always to avoid soaking the plate, as by so doing the markings due to the oxalate of lime, formed by the precipitation of lime from the wash water, were avoided.

The reason for this avoidance has, however, vanished, since if the plate be soaked in an alum bath either before or after fixing, the calcium oxalate is at once dissolved, and no trace of it can be seen on the finished plate. My advice, therefore, when using ferrous oxalate development, is to soak the plate thoroughly in water before developing, more particularly if it be made with hard gelatine. When it is considered that a gelatine film acts as a septum it is not hard to see how the penetration of the ferrous oxalate is prevented by it. It would be a great satisfaction to me if I could only "write" people into giving this development a fair trial. I am sure that when once they mastered it they would abandon the dirtier alkaline developer. In the ferrous oxalate development there is only one solution, or at the most, two, the strength of which must be watched; while with the alkaline developer there are three. In the one case the combinations are few, with the latter many; and I have no doubt that it is varying combinations which make development a matter of such difficulty with so many.

One word with regard to frilling. I have found that Mr. Palmer's recommendation to soak the plate in a saturated solution of sulphate of magnesia or Epsom salts was a complete cure for a moderately bad case, and the sensitiveness did not seem to be impaired in the least. A relation of my own has, however, tried it thoroughly, and finds it ineffectual. The causes of frilling are various, and the Epsom salts appears to be a remedy only in certain instances.

I propose later to say a few words on a recent practical trial of collodion emulsion *versus* gelatine emulsion. I need only say one word regarding collodion emulsion, which is that the alum bath is as effective in destroying fog in it, or in destroying the image on a plate, as many of the substances which I have from time to time enumerated.

◆

HENDERSON'S COPYING-FRAME AND VIGNETTING PENDULUM.

The description of these, which stood over from last week's report of the Thursday Evening Meetings, is now laid before our readers.

The copying frame is built up out of a series of nested carriers (A, Fig. 1), these being held together by a sliding key, B.

The negative to be copied is placed in the groove in the bottom of one of the holders, and the key B, the bottom of which is hollowed Λ-shape, and will, therefore, hold a negative of any thickness, is pressed down on it so as to hold it firmly in position.

If an oval picture be desired, there is an arrangement (Fig. 2) to slide in front of the negative, consisting of a series of oval masks arranged on the principle of rotating stops, so that either sized oval can be readily used.

It will be seen that, by the use of this arrangement, a negative, on glass of any thickness, or even a single figure from a group, can be easily copied.

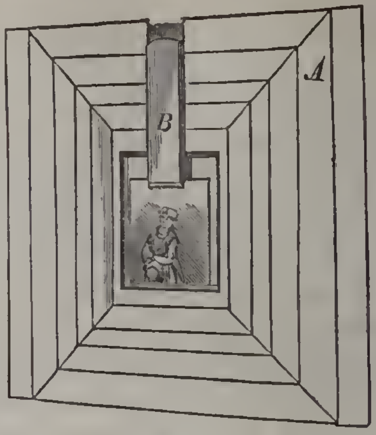


Fig. 1.

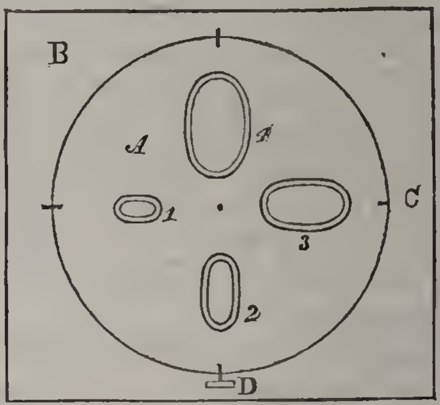


Fig. 2.

The pendulum vignetter for taking vignettes direct in the camera is illustrated in Fig. 3.

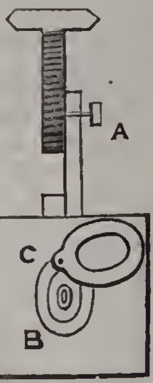


Fig. 3.

A. Rack-and-pinion arrangement for lengthening or shortening.
B. Series of oval diaphragms, rivetted together at C.

This apparatus is to be suspended between the lens and the picture to be copied, care being taken to get the picture in the centre. The pendulum is then gently set in motion, the distance from the lens, and the size of the aperture used, of course, varying according to the size of vignette required.

◆

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No. 5.—In a Private Lunatic Asylum.

Truly we get very odd jobs to do sometimes, and this one proved the oddest I have had for some time. Herr Schaub has a splendid establishment about seven miles out of Dublin, where he tends and takes care of wealthy lunatics. Last week I was startled by the announcement that there was a doctor below wished to see me. Wondering if some accident had happened at home, and hoping that he had made a mistake (for I thought, had he merely called upon photographic business they could have answered him downstairs without having my presence at all), I stepped down, and found myself face to face with a slim, middle-aged man, plain in dress, plain in features, and having a peculiarly mild blue eye. One keen glance he threw at me with his blue eyes, then with a smile exclaimed, "Goot day. You vill do—you vill do ver vell." Seeing my astonishment, he explained to me that he was Herr Dr. Schaub, of G——; that he had been to other photographers, but had found them useless to him, inasmuch as they seemed to have no nerve or animal magnetism in their composition. I opened my eyes still wider, and began to think I was in presence of a patient instead of the doctor. That I have plenty of nerve I know, but it was news to know that I had a store of animal magnetism concealed about my person. The gist of the whole talk was to the effect that he had under his care the son of an English peer; that he had received orders to have him photographed, whatever the expense might be; that this patient was one of his best and worst—the best to pay, and worst to manage; that he was blind and dumb; that he was at times as ferocious as a tiger, and that he was suicidal. "But," he concluded, "you shall see. He is von great study. You shall vind him von natural genius." I here made a little demur about not exactly liking the job.

"Bah!" he cried, as he patted me on the shoulder, "you vill do vell. There shall be no trouble. You shall vind yourself quite at home."

It was my turn to give him a keen look; but no, he did not mean it. He was too earnest for a joke.

Next morning, with a cabinet repeating camera and lens, together with four slides, so that I could take eight pictures, I got on to one of those abominations, an Irish jaunting car, and after having my hand nearly wrung to pieces in mock sorrow, and being requested to leave a lock of my hair, "for they felt certain I would be kept," I started on my seven miles drive. A drive, as a rule, raises my spirits—especially on a bright morning—but somehow the fresh air, the exhilarating pace, the novelty of the road, the bright sunshine, had no effect on me. I felt depressed. To take a beetle-browed convict, a group of black grinning Zulus, a born imbecile, a nice quiet corpse, would have been nothing;—I have done that before; but a roaring lunatic! To make things worse, some of the harness snapped just as we were opposite the cemetery where the Liberator Dan O'Connell is buried, and I had twenty minutes to wait before it could be made right. "To pass the time away, sor," quoth Jehu, "yer might take a turn round the monument; ye'll see the great O'Connel's coffin; sure, sor, the sight of it will refresh yer entirely." Thinking that I could not do better, I entered the sacred precinct, and presently found myself peering through the iron rails at the oak coffin that contains the mortal remains of the famous O'Connell. Around the base of the monument is a goodly sized circle lined with vaults, in which you can behold the oaken caskets containing the ashes of members of the greatest families in Ireland. The sight did not refresh me as my prognosticating Jehu had thought. I wondered what had possessed me to try the cheering atmosphere of a charnel house. I felt out of my element—as if I was intruding among a select party of aristocratic ghosts. Around me were all the accessories that go to the making up of a good sensational ghost scene—vaults, coffins, and silence—"emblematic scrolls, mort heads and bones together met." Had it been midnight I would have brought home a harrowing tale of horror.

Out on the road once more, I tried the soothing effect of a smoke, and felt considerably better by the time we drove up to Dr. Schaub's gate. I suppose the animal magnetism was doing its duty. The doctor met me halfway up the carriage drive, and immediately carried me off to view the garden and part of the grounds. Everything was trim and beautiful; the whole place breathed of peace, plenty, and sunshine; tall trees, shady groves, and chirriping birds; the house itself sleeping peacefully in the bright sun, with its four Doric pillars almost hid by the masses of roses that clung around them. No one would for an instant dream that this was other than the happy home of some country squire. Pass the portal, and be undeceived. A door is unlocked, and you pass in; while you wipe your feet on the mat you hear the lock turned upon you. Every door you pass through has to be unlocked, and is carefully locked after you. You throw all idea of domesticity and hospitality to the winds, and fancy you are in prison.

Through room after room, and passage after passage, we went, until we emerged at the back, where, in a small glade surrounded by trees, I perceived a cottage, the windows of which were covered with a network of strong iron rods. The doctor intimated that this was where my sitter was, and telling me not to be frightened, quickly crossed the open space and entered the cottage, while I followed him closely. Without knocking, he opened the locked parlour door and entered. I did the same, and snap went the lock behind me. My first glance showed me two great men—keepers—seated beside the door; that was, as I say, a glance, but a better definition would be to call it an impression, for truly my eyes were only for my sitter.

On a mat in the opposite corner I beheld the son of a peer. The first thing that struck me was his continual motion, something after the fashion of a bear; while his head—that awful head with its great visionless eyes—lolled from side to side as if too heavy for the neck that bore it. This head was perfectly bald, never had been any hair on it, and the abnormal development of the skull was astounding. At first I thought he was suffering from hydrocephalus, but soon discovered my mistake; the head was twisted likewise, being fuller at one side than the other, and, taken all together, was twice the size of an ordinary man's head. The want of eyebrows gave a most singular appearance to the large, round, white grey eyes; a flat nose and a huge mouth completes the picture of this strange, unfortunate being. When we entered he seemed to fix his eyes upon me; when I moved noiselessly a step or two over the floor, intending to get without range of their glare, they followed me as if he had the full use of them. A moment or so after our entrance, during which his ghoul-like eyes seemed to watch me intently, my sitter, with a lurching motion, raised himself, and, to my great discomfiture, shambled straight over to me. Dr. Schaub signed me to remain still; while the stalwart, silent keepers, as if moved by the same impulse, stepped one on each side of me. When on his feet I was enabled to the full to see the extent of the poor wretch's deformity. There was not a single limb perfect; his hands were large and flabby, while his arms were of exceeding length. Involuntarily I clenched my hands, and I felt the biceps tightening, but there was no occasion to put them in use. With a lubberly movement he passed one of his great, cold, clammy hands over my face, then through my hair, the abundance of which seemed to strike him as very strange; as he continued pulling and rumpling at my curls with one hand, he rubbed his own smooth pate with the other, until the doctor admonished him, whereupon he retired to his mat.

What my sensations were during this ordeal I leave you to imagine. I felt something like being awakened from a nightmare when released from the monster's uncouth attentions. He proved wonderfully tractable that morning, and in a short space of time I had exposed two of my dark slides. The others, the doctor informed me, had to be taken in another room. This proved to be an outhouse attached to the cottage, and built like a billiard-room. It was lighted from the top, and nicely carpeted; the walls, to the height of five feet, were thickly padded. At one end was a splendid Collard and Collard grand piano, a strong wooden chair in front of it, but no music or music-stand. The sunlight was streaming obliquely through the cupola, and, as luck would have it, gave me a very decent light in front of the piano. Here I exposed my other four films in rapid succession, the poor fellow sitting in front of the beautiful instrument like some loathsome reptile, escaped from its noisome marshes, which had wandered within the shade of some tenderly cared-for exotic. I daresay my looks expressed the astonishment I felt at having to take him thus, for directly I intimated I was finished, the doctor said something to him in a low tone. Instantly the whole inert mass seemed to be imbued with vitality; the bear-like movement ceased, the great listless fingers sought the keys of the piano, and in a moment the place was filled with strains that I never heard the like of before, and am sure I shall never hear the same again. It was wild, weird, pathetic; it was at one time the jangle of contending fiends, anon an angel's requiem; it was never discordant—each chord was struck with marvellous delicacy—he actually made the instrument speak; at once you heard the cry of a despairing soul—the humble beseeching of a weary spirit—the fierce defiance of a proud, rebellious heart!

Amazed—bewildered—I left the mansion in company with the doctor, who on the way told me that this musical genius was merely a gift of nature—perhaps to compensate for the niggardness she had shown in her other benefits; he never had any tuition; his music was all extempore. "If he vas right," quoth the doctor, "and had that genius, he vould be vorth millions to take through the world."

I have nothing particular to state about the developing of the plates; but my experience has taught me that you cannot be too careful in dusting your plates (commercial plates, I allude to) before placing them in the dark slide; you may as well give a look through them in case there may be an air-bubble in the emulsion, even although the plates are those of a renowned firm. You should likewise use a fine camel hair brush when you steep the plate and while developing; otherwise, you may find little air-bubbles that will give you a great deal of trouble in spotting out. I cannot help thinking that a little more care might be taken in the packing of plates by the makers; there seem to be hairs, straw, and dust to any amount upon some of them. And another thing I have to complain of most bitterly, and that is the awful density of one end of the plate, compared with the other. Could there be no improvement made with the coating? Every one of these plates that I used at Dr. Schaub's had a dense end and a thin. The thin was too weak, and the dense over dense, entailing the cutting of the negative, so that they could be treated separately. This is all very well, and I can remedy the faults of the plate-makers when a whole plate is divided thus into two cabinets; but it is different when I have to to take whole plates, as I had the other day, viz., a gentleman holding a cob. Herein I find that the hind-quarters of the cob take four times as long to print as the gentleman and his head, and the same with views of a house—one half printing like a flash, and the other taking half a day. I intend to treat further on the subject in my next; meantime, I have to say that if such plates are put out by well-known firms, photographers will have to make their own plates, or do as a good many are doing—fall back upon the (slow but sure) silver bath.

Correspondence.

AT HOME WITH ANNAN BROTHERS.

DEAR SIR,—As I was, unfortunately, from home when you visited us, I feel constrained to say something concerning your very favourable article about us.

It was with a sense of relief that I read that others had failures and discouragements with carbon printing, for I have had many, and still have; yet it is eminently worthy of an endeavour to master its difficulties. At one time I felt, like Mr. Roger Fenton (on account of the fading of silver prints), that photography would have no future; but when Mr. Swan sent out his first specimens of carbon printing, I felt then that it was to have a future after all. At that time—about the end of the year 1865—I was in terms with the late Mr. D. O. Hill, R.S.A., to reproduce his important picture, "The First General Assembly of the Free Church of Scotland." Early in the following year I made some 36-inch negatives from that picture, which were printed by Mr. Swan, to the entire satisfaction of Mr. Hill, who wrote that the carbon process had already reached, in his hands, the very acme of perfection. For that picture Mr. Hill, along with his friend Mr. Robert Adamson (who died in early manhood), as early as 1843, employed photography as a means of securing a likeness for artistic purposes. Besides the portraits he took for that picture, he did many of the distinguished literary and artistic men of that time, and I have now in my possession portraits of Professor Wilson (the Christopher North of Blackwood's magazine), Lockhart (the son-in-law and biographer of Sir Walter Scott), and many others; and, what is remarkable, although printed at that time, they are in very perfect preservation, some of them not faded at all, while others again have gone the way of so many silver prints. They are of a rich brown colour, not having been toned. They were printed with ammonia nitrate on plain paper, and got, I understand, very little washing. I understand that it is in the experience of all old photographers that, with the same careful treatment, they find some of their prints almost permanent, while others fade too rapidly.

Although we went in for carbon printing so early, it has only been for the last few years that we have done it ourselves, and I am sorry we cannot do all our work with it; but it is of immense advantage to be able to do large work (and that is what it is best suited for; in the meantime, I thought, like others, that Lambert had surmounted its difficulties in regard to small work, but I find it impracticable.

I am glad you liked our interiors, and mentioned specially that they were very free from halation. I am not able to overcome that, but do my best to avoid it. It occurs with long exposures. The windows in Glasgow Cathedral were done with very short exposures to get them as perfect as possible, so the architectural parts were sacrificed. In the Hamilton Palace interiors I managed to get them without showing the windows at all in the photograph, the lighting of the Palace being well suited for that; the light, however, was not so strong, so I had to give a number of them an exposure of more than an hour. As I used a very large plate for the size of the lens, the drying that took place did not come down to the picture. I think it is always an advantage to use a small lens on large plates for interiors, as you get all that the lens will make, and you can cut the picture down to what you like best. These interiors were all done with wet collodion, but I have got lately with gelatine plates as good results with a very much shortened exposure; but these long exposures had an advantage too, for in such a place as Hamilton Palace it gave me the opportunity of studying the innumerable works of art contained within its walls. The Hamilton family have been for centuries patrons of the great artists. The second Marquis, created Duke by his friend Charles the First (he suffered death for his sake), the only king of England who really loved art, seems to have been animated with the same feeling, for he commissioned Rubens to paint one of his most important pictures, "Daniel in the Den of Lions," and it still adorns the great gallery.

In the same gallery are portraits of King Charles and his Queen Henrietta Maria, the Duke himself and the Duchess, the beautiful Mary Feilding and her father the Earl of Denbigh, all by Vandyke; but time would fail to tell you of all the wonderful works of art there; some other time I may.—I am, yours, &c., THOMAS ANNAN.

[Mr. Annan informs us that, in the case of his series of interiors, he overcame the halation difficulty by making a special negative of the window with a short exposure, and resorting to double printing. The perfection of result arrived at by this method is the best proof of its value.—Ed. P.N.]

BALLOON PHOTOGRAPHY.

Sir,—I am desired by the President and Council of the Balloon Society to state that arrangements have been made for a special balloon ascent on the 10th of September next from Lillie Bridge Grounds, with a view, if possible, of taking photographs of London from a balloon. I shall be happy to furnish any of your subscribers bringing a camera with a ticket of admission to the grounds.—Faithfully yours, A. Standing, Hon. Sec.

GELATINO-CHLORIDE.

Sir,—In my recent article—"The Discussion on Gelatino-Chloride Emulsion" (Photographic News, page 387 of present volume)—an error has crept into the first line (on page 288), where, for "the line I in the blue," should be read, " the line G in the blue.

According to our experiments, the maximum of sensitiveness of gelatino-bromide plates is situated at almost exactly the same point; only, in this case, the action stretched much farther towards the red end of the spectrum. Dr. Eder.

GELATINE *V.* COLLODION.

Dear Sir,—As it will not benefit the cause of either gelatine or collodion to descend to weak personalites, I will pass over that part of Mr. Henderson's letter in which it has pleased him (and not hurt me) to reflect upon myself, and go to the matter in hand.

There is very little to be said, for, in my opinion, Mr. Henderson has proved my case, for while he infers that it is impossible to make a good reliable plate for 18s. per gross, and says I am to be envied if I have found such a plate, he proves to the contrary, for, if his figures are right, the materials, *including glass*, cost just a fraction over 4s. 6d. per gross. Surely, 13s. 6d. upon an outlay of 4s. 6d. is enough to pay for labour, dealer's profit, &c., &c. In stating the quantities for gelatino-bromide, Mr. Henderson does not cut things so fine as he does for collodion; for instance, he gives the amount of silver nitrate at 5 ounces to sensitize 70 dozen quarter-plates, while for bath and collodion he gives only 6 ounces to sensitize 130 dozen. Taking, therefore, his own calculations, and adding to his estimate of the cost of collodion and bath the price of *suitable* glass, the balance must be in favour of gelatine. I say *suitable* glass, for a much better quality of glass must be used for collodion, and the cheapest glass I have been able to use without staining cost me nearly double—what Mr. Henderson calculates is the cost per gross of all the materials for gelatino-bromide plates, *glass included.* Even when using a preliminary coating of albumen, I paid 4s. 3d. per gross for quarter plates. But even were the cost of gelatino-bromide plates more than bath and collodion, I should prefer to use them, for the saving of time, the comfort of working, and the certainty and superiority of result would far outweigh the cost.—Yours truly, George Croughton.

Lowestoft, August 30th.

◆

Proceedings of Societies.

Manchester Photographic Society.

The seventh out-door meeting of this Society during the past season took place on Saturday, the 27th inst., at Manley Park. Although the members mustered fairly well, the weather was much at fault in the early part of the day, but with afternoon came more favourable light, &c. Through the kindness of Leonard Cooper, Esq., the members were allowed to ramble through the ferneries, greenhouses, vineries, &c. In fact, every part of the Hall Grounds was placed at their disposal, and during the afternoon Mr. Cooper escorted the members to many spots where excellent views were obtained; and he directed the very pretty fountains to be turned on for their pleasure. Many plates were exposed there.

The meeting proved a most enjoyable one, and doubtless many good pictures were obtained. Being situated very near to Manchester, many members lived within easy distance, whilst others resided a long way off; but this inconvenience was ameliorated by the former inviting the latter to tea.

The next ordinary meeting of the Society will be held in the new rooms of the Manchester Mechanics' Institution, in the large Hall, on Thursday, September 8th, 1881. Tea at 6.30 o'clock, when all members should endeavour to be present.

The next out-door meeting of this Society will take place on September 10th, 1881, at Chadkirk, leaving Manchester by train from London Road Station at 1.20., for Romiley Station.

Glasgow Photographic Association.

The first out-door meeting of this Association was held on the 25th ult., when a few members who fairly represented the spirit and ability of the Association left the City by the 8 o'clock a.m. train for Lock Eck by way of Greenock and Kilmun. Although the fore part of the day was dry, it was found on reaching Lock Eck to be too dull and hazy to expect any great results from the plates exposed to the magnificent scenery of this part of the country. Nevertheless, the enthusiasm of the party was high, and many gallant efforts were made to do full justice to the subjects. In the afternoon the rain began to fall in such a determined manner as to suggest but one idea—viz., to beat a hasty retreat. This was promptly carried out, and the party reached home in the evening, and determined to meet at an early date to compare notes.

Thursday Evenings for Photographers.

At the meeting held August 25th, Mr. C. Read in the chair,

The Chairman, in the course of a few introductory remarks, alluded to the platinotype prints developed by Mr. Cobb at the last meeting, and expressed surprise—he not being a professional photographer—at the great general knowledge of chemistry, and the characteristics of metals, &c., displayed by photographers, and said it was his opinion that if the philosopher's stone be ever discovered, it would be by means of photography.

Mr. A. J. Brown exhibited an instantaneous shutter, opening from, and closing to, the centre of the lens. He also showed two models of shutters, in one of which the spring crossed the centre of the aperture.

Mr. Cutchey thought that if the spring crossed the aperture, it would give an opaque bar on the plate.

Mr. Debenham said it would do so if the diameter of the stop used was no larger than the width of the spring; but otherwise it would not.

Mr. Henderson produced some of the platinotype prints developed by Mr. Cobb at the last meeting, mounted in various ways (against the glass, &c); but the opinion of the meeting still seemed to be that, until a greater warmth and brilliancy can be given to prints by this process, they will not take the place which silver prints now occupy in the good opinion of the general public.

Mr. Henderson said he had placed one of the prints in "Ozone Bleach" for about fourteen hours, and found it was slightly reduced.

The Chairman introduced to the meeting Mr. Blake, a representative of the American Press, who said he found that the old country was far in advance of the new—in photography at least, especially with the gelatino-bromide process, although he could not compliment us upon our climate, as it had rained ever since he had arrived (about ten days back), and still seemed likely to continue to do so. He exhibited to the meeting a camera manufactured by an eminent American firm, of very light construction, the camera, a lens, eighteen 7 by 5 plates, and packing-case, only weighing about twelve pounds. The dark-slides were made with millboard shutters. He found this camera very useful in travelling, and very durable; he had had it in use about three years. He also showed one of Morrison's wide-angle lenses, which, he said, covered an angle of about 100 degrees.

Mr. Henderson shortly reviewed the letters on his paper—"Collodion *v.* Gelatine"—which have been published in the Photographic News.

In the course of a short discussion which followed,

Mr. Debenham said in his practice he used half-an-ounce of developing solution to a half-plate.

Mr. CUTCHEY had, on the previous Saturday, separately developed six quarter-plates with an ounce of developing solution, and then he had a drachm left.

BOLTON PHOTOGRAPHIC SOCIETY.

THE annual out-door meeting of this Society was held at Whalley on Saturday last. In consequence of the unsettled state of the weather the party was small compared to the gathering of last year. However, the day, though very threatening about twelve o'clock, cleared up, and remained fine during the whole of the afternoon. The members left Bolton by the 1.10 train, and arrived in Whalley about three.

The first place of resort was the church, upon which every one present, in the possession of a camera, exposed a plate, some little difficulty being experienced in consequence of the wind keeping the foliage in almost constant agitation, it requiring considerable adroitness to catch the desired object during the lulls, which were both few and short. After all had been more or less successful in their endeavours, a move was made to the Abbey grounds, where photographs were taken of the various interesting and picturesque portions of the ruins; the frequent succession of gusts of wind being again a great drawback. The largest number of plates were exposed here, the Abbey, in fact, forming the principal feature of the day's work.

Two of the party were now sent on by trap, with the various camera, stands, &c., to Mytton, to order tea and make any further arrangements necessary, the remainder proceeding on foot. After a very pleasant walk to the church, upon which one or two plates were exposed, an adjournment was made to the Aspinall Arms for tea. Whilst the final preparation for this was made, Mr. Taylor took a photograph of the members present in the garden adjoining the hotel.

The President of the Society, John Hick, Esq., was unable, through absence from home, to meet the party as invited. He, however, conveyed through Mr. Parkinson his acknowledgment of the invitation, and regretted his inability to meet them.

A most substantial tea was done ample justice to, Mr. Boothroyd, as carver, finding constant employment to serve the demands made upon him. Tea being disposed of, a visit was paid to Mytton Hall by some of the members, others preferring to stroll about the lanes until they returned to Whalley. These tastes having been gratified, and the time for departure arrived, the party left Mytton in two conveyances, and were speedily driven to Whalley Station, leaving there by the 8.1 p.m. train to Blackburn, time being sufficient here before the arrival of the express to redevelop the inner man with various necessary liquid refreshments. The party arrived at Bolton, without further adventure, about 10 p.m., mutually agreeing that they had spent a most pleasant afternoon.

Talk in the Studio.

THE POLYTECHNIC.—A paragraph announcing that this popular establishment would be finally closed on Saturday last has been going the round of the journals; but the report has, we are glad to say, proved erroneous, as those varied entertainments which have made this Institution so justly popular are still provided for the public. It is, however, understood that unless certain negotiations, which are now pending, for the sale of the Polytechnic to a new proprietorate, are carried out, there is a possibility of the Institution shortly being closed; but there is good reason to hope that this undesirable event may not happen. Much sound scientific information is conveyed in a popular and agreeable manner in the Regent Street lecture rooms, and those of our readers who wish to be amused and instructed at the same time should make a point of visiting the Polytechnic, a most attractive programme being now put forward.

THE SAINT-GOTHARD TUNNEL.—Arrangements are being made for not only lighting this tunnel by electricity, but it is hoped that electric force may be made available for propelling the trains. Abundant water power is available in the neighbourhood, and secondary batteries or accumulators will probably be used to compensate for any irregularities.

THE BALLOON SOCIETY OF GREAT BRITAIN.—The second annual report has been issued, and we find that the number of members now enrolled is near upon 2,000. Thirty-three papers were read, or lectures delivered, during the past session, and the variety of subjects treated of in these rather fulfils the promise of the general sub-title of the association—viz., "a popular Scientific Society"—than of the more specific name, "The Balloon Society." The Balloon Society is no doubt doing useful work in popularizing scientific matters, and those of our readers who wish to spend occasional pleasant evenings should become members, the chief qualification being a payment of 5s. annually.

THE RECENT MILITARY FETE AT OSBORNE.—To commemorate this occasion, Mr. Jabez Hughes, of Ryde, was present by command to photograph the ceremony. By the instantaneous process he was able to secure accurate representations showing Her Majesty in the act of pinning the medals on the men's breasts. Mr. Hughes also received instructions to photograph the men who received the medals, and also the little dog Bob.—*Isle of Wight Times.*

THE AXOLOTL.—In a recent number of the NEWS we referred to Semper's experiments on the remarkable action of light on this reptile. We are now pleased to be able to inform our readers that more than one specimen of the axolotl may be seen at the Brighton Aquarium. Although the circumstance that white light causes the dark pigment of the Mexican lizard in question to rapidly disappear has been under the notice of several eminent men of science, no satisfactory theory has yet been brought to bear on the question.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER & CARTER, "*Photographic News*" *Office*, 5, *Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER & CARTER, *and crossed* "*Union Bank, Photographic News Co. Account.*"

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 3. Cash at the time of sitting: How I get it," to be sent in by the 1st Oct. No name need appear. For rules, see previous numbers of NEWS.

MAJOR GORDON.—1. The sum mentioned would certainly not be excessive. 2. We consider that finer transparencies can be made by the carbon process than on Beechy plates; but unless you have had considerable experience in the former process, you would do well to make use of the latter. 3. Such a state of things is to be regretted.

C. E. G.—It may be considered an average developer, except as regards the bromide, which might in most cases be reduced to one-third; or, at any rate, to one grain in place of the 2½ grains.

F. W. BARBER.—"Hardwich's Photographic Chemistry, published by Churchill, although a little old-fashioned, is an admirable book, from which you may learn much. The same remarks apply to "Hunt's Photography," published as a volume of the "Encyclopædia Metropolitana." There is no difficulty in obtaining a second-hand copy. Liebert's comprehensive hand-book called "La Photographie en Amérique" is a magnificent volume, freely illustrated with carbon prints as examples of lighting, posing, &c. A very complete series of books on photographic subjects is published by Gauthier Villars, 55, Quai des Augustins, Paris, and you should write for a list of them.

MOKESWIFT.—We do not know anything about the firm in question.

J. D. POOLE.—Thin places in the original film.

CAMBRAIN.—1. We should certainly prefer glass, but ebonite may be used. 2. The acid phosphate is sufficiently soluble. 3. Either black lead or copper bronze powder, this latter being especially useful when the copper solution is nearly neutral. 5. The Pretsch process possesses many excellent characteristics, and although it barely struggles for existence at the present time, it is quite possible that it may come into general use before very long.

AMATEUR.—Send a piece of one of the negatives for us to see.

JOHN SEEDER.—Use a stronger bath, and do not allow the paper to remain in contact with the solution for so long a time.

A BUSY PHOTOGRAPHER.—1. It is very desirable to size the paper with a weak solution of gelatine. 2. Not unless an unusually tough variety of pyroxyline is made use of. 3. The only suitable solvent is chloroform.

A. D. M.—You have evidently had light petroleum supplied you instead of benzole.

M. S. BARTON.—Stop out the holes, the negative being already varnished, with rather thin Indian ink. A very fine sable brush, rolled to a point, is the most suitable tool to employ. Care must be taken neither to apply a too dense spot of the ink, nor to allow it to extend beyond the limits of the pinhole, or a white spot will appear on the print. It often happens that a pinhole looks very obvious in the case of a negative, but produces so small a black speck on the print as to be scarcely noticeable.

M. DEMPSTER.—A thin bitumenous varnish answers the purpose perfectly well; say one part of Judea pitch dissolved in six parts of benzole.

L. MARSTON.—The fact of the polished edge having become roughened by rust quite unfits the instrument for use. Rub down on very fine emery cloth till all depressions are removed, after which surface by means of a Turkey stone and oil.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1201.—*September* 9, 1881.

CONTENTS.

	PAGE
The New Element Actinium	421
Double Combination Landscape Lenses	421
The British Association	423
My Ride to York. By William Cobb	423
By-the-Bye.—The Ownership of the Negative	424
French Correspondence. By Leon Vidal	425
Notes	426
Topics of the Day.—On Photographers. By a Sitter	427
Frilling. By Ragy	427
Royal Cornwall Polytechnic; List of Awards	428
Action of the Solar Spectrum and Chemical Development on Silver Chloride. By Dr. Eder and Captain Pizzighelli	428
The Uses of Glass in Photography. By Thomas Gaffield	428
Correspondence.—Chloride of Silver *v.* Bromide of Silver in Gelatine Emulsion—Tardy Execution of Orders: Emulsion Matters—Gelatine *v.* Collodion—The Staining Question	430
Proceedings of Societies	431
Talk in the Studio	432
To Correspondents	432

THE NEW ELEMENT ACTINIUM.

Dr. Phipson writes us that he has succeeded in isolating the new metallic element actinium in the form of oxide, and in the form of sulphide. We stated in our article last week that he would, in all probability, either isolate the new metal, or prove its non-existence. The former result was obtained after a lengthened series of experiments; the oxide of the new metal was isolated in a state of purity late on Saturday night, the 3rd of September, and the results of this interesting investigation were communicated to the British Association by telegram on Monday, the 5th. The oxide of actinium is white, with a tinge of salmon-colour; it is very slightly soluble in caustic soda, and in this way is separated from oxide of zinc. It does not change colour when exposed to the air, like oxide of manganese, nor does it appear to be affected by sunlight. It is not precipitated by ammonia from solutions containing ammoniacal salts. The sulphide, as precipitated from neutral or alkaline solutions by sulphide of ammonia, is pale canary yellow, not soluble in acetic acid, but readily so in mineral acids, even somewhat dilute. It darkens in about twenty minutes when exposed to sunlight, and then becomes quite black; this does not occur if the sulphide is protected by a piece of ordinary window glass. It is this curious actinic property that led to its discovery, and induced Dr. Phipson to call the new metal actinium.

Our readers will be able to call to mind several new metals which have been discovered through the agency of spectrum analysis, but to Dr. Phipson belongs the honour of having initiated a new method of finding the hidden treasures of the metal world. Actinium is likely to prove not merely a new element, but a novel one; that is to say, one would expect to find it very notably characteristic in its properties, and distinct from other metals. This is not always the case with new elements, rubidium and cæsium being, for example, so analogous to the previously known alkali metals as to have but little special interest attached to them.

The remarkable properties of the sulphide of actinium, especially with regard to those rays which are cut off by glass, point to a possibility of our learning much with regard to the nature of spectrum by a study of its action on sulphide of actinium; but it must of course be borne in mind that a glass prism could not be used. It is likely, however, that some other transparent medium may be employed, or diffraction gratings may, perhaps, be pressed into service.

Probably before long Dr. Phipson will be in a position to inform us as to the relative transparency of various media for those rays which affect actinium; but there is more labour involved in studying a new element than might be supposed by those who are unaccustomed to laboratory work, so results must not be expected too rapidly. The chemist upon whose shoulders a new element rests, bears a burden which is by no means light.

◆

DOUBLE COMBINATION LANDSCAPE LENSES.

We promised a short time ago to say a few words on the subject of double combination landscape lenses.

The advantages they have over single view lenses is that, for the most part, they give no distortion, and that, further, they may be used with larger aperture when the same angle of view is included. On the other hand, they give a less brilliant picture on account of the many surfaces of reflection which they possess, so that, when the subject is purely landscape, the angle limited, and a very short exposure not required, the single lens is to be preferred.

We shall briefly describe the various forms which are most commonly in use, beginning with those which work with the largest aperture.

First among these comes the "patent group lens," and the "universal." These both work at about the same aperture, namely, one somewhat greater than $\frac{f}{6}$. They may be considered simply as portrait lenses of small diameter, and with the combinations fitted closer to each other in comparison with their diameter than in ordinary portrait lenses, so that they can be used with a considerable angle when a small stop is used. So used, they give excellent definition, and when used full aperture make an excellent portrait lens. We know of several professional photographers who now use no more rapid a lens than this in their studios.

Next comes Voigtländer's new objective. This works at about $\frac{f}{6}$, so that it is little, if at all, slower than the last mentioned. It consists of two meniscus lenses with their concave sides next each other. We have not used one of these objectives, but have in our possession a lens sold by the name of the "Euryscope" lens, and which is said to be made on the same pattern as Voigtländer's. It is an excellent lens, giving full aperture, exquisite definition through a narrow angle; and with a small stop, through a considerable one. As might be imagined from its large diameter, its flatness of field is not quite so great as with the lenses which come next in the order of rapidity, viz., those which go by the names of "rapid rectilinear," "rapid symmetrical," "true view," "planographic," &c. These, as in Voigtländer's objective, consist of a pair of menisсuses placed with the concave sides next each other, and work at maximum aperture varying from $\frac{f}{8}$ to $\frac{f}{10}$, so that their rapidity is only about half that of the last-mentioned lens. For the purposes for which they are intended, no better form of lens could be obtained. The aperture mentioned seems to be the largest which will enable flatness of field to be obtained through an angle of about 45°. In these lenses, when a small stop is used, definition and approximate equality of illumination can be obtained through an angle of about 60°.

We have had practical experience of all the four makes which we have mentioned, and have found the first three to be excellent in every way. The "planographic" (the manufacture of which has, we believe, entirely ceased) we have found a very uncertain lens. An excellent one may be obtained occasionally; but a trial should always be made before one is purchased. We may class the whole of the lenses which we have described under the head of lenses suitable for instantaneous exposures, or, more strictly speaking, lenses commonly used for instantaneous pictures; and when the angle required to be used is very limited, the picture obtained, when full aperture is used, will be everything that could be desired; but, for everything beyond a very small angle, all these lenses, with open aperture, have the same fault. This is a fault which necessarily accompanies a double-combination lens, used with an aperture nearly equal to the diameter of the lenses. It is inequality of illumination. A moment's consideration will show that, when the lenses are placed one at each end of a tube of considerable length, the pencils of light which pass straight through the tube must be much larger than those which pass diagonally, as the latter have their size much reduced. To obtain even approximately equal illumination in a lens of this form, with a given stop, the angle must not exceed such a one as will allow the image at the corners of the plate to be formed by pencils of light, which are bounded only by the edges of the stop. It is evident that with a double combination lens, used with a stop almost the same diameter as the lenses, the pencils of light will, beyond a very small angle, be bounded by the ends of the lens-tube, and not by the stop.

This leads us to the first of the double combination lenses, in order of rapidity, which possesses every qualification of a perfect view lens. We refer to the "symmetrical" lens. We do not mean to say that any or all the lenses we have mentioned are not excellent for certain purposes, but even in the slower forms of these a little of the quality required in a landscape lens has been sacrificed to rapidity — either flatness of field, equality of illumination, or maximum angle. They are lenses made to fulfil several different duties, and it would be quite unreasonable to expect them to do each one of these as well as a lens designed for the purpose of doing nothing else.

The symmetrical lens works with an aperture of $\frac{f}{15}$, so that it is at least four times as slow as any of the lenses before mentioned; yet such is the sensitiveness attainable with modern dry plates, that Mr. G. F. Williams mentions, in the YEAR-BOOK, his having taken views with this lens with an exposure of less than $\frac{1}{10}$ of a second.

The size of plate which this lens will cover is, in proportion to its focal length, very great; in fact, if it be used for the largest plate which it will cover with the smallest stop, the angle is greater than ought to be used for any picture, except in very exceptional circumstances.

The next lens in order is the wide angle rectilinear. This lens includes even a somewhat greater angle than the symmetrical, but, like it, should not be used for the largest plate which it will cover, except in working in very confined situations.

Both the last mentioned lenses consist of a pair of meniscuses arranged, as in the rapid series, with their concave sides towards each other; but in this case the combinations, instead of being placed at a distance equal to about one and a-half times the diameter of the lenses, are placed so near each other that there is only room for the stop between; and as all the stops are much smaller in diameter than the lenses, every pencil of light which goes to form the image is bounded by the stop only, so that lumination is as nearly equal as possible.

With the exception of the first two, the patent group lens and the universal lens, all these which we have described are non-distorting; that is to say, that in the image given by them, the position of any point corresponds to its position in the subject, and straight lines even at the edges are truly rendered.

We said of the wide angle rectilinear and of the symmetrical lenses, that the illumination is over the whole of the field of view as equal as possible. The same would apply to a single lens. The illumination given by any of these lenses will be far more equal than it would be if some of the pencils of light were bounded by the lens mount instead of by the diaphragm; but there is no lens which will give absolutely equal illumination even through a small angle, whilst if a large angle be included, a lens of any form must give considerable inequality of illumination.

At the Photographic Club a week or two ago, a very interesting discussion arose on the subject of copying pictures, and the suitability of various lens for the purpose was touched upon. It was said by some that the effect of using a short focus—that is, a wide angle—lens, would be to cause the picture to be represented "all out of drawing." This was shown to be a mistake, as in photographing any subject all in one plane, the resulting picture will be exactly the same as regards form, whatever be the angle which the subject has subtended to the lens. It was also pointed out that the only evil which would actually result from using a wide angle lens would be inequality of illumination, and that to avoid this as long focus a lens should be used as the conditions would permit.

It may be well to say a few words on the laws which govern this inequality of illumination, which all who have ever used a wide angle lens must have noticed. There are three causes which go to produce it.

First, the pencils which form the image towards the edge of the plate pass through the diaphragm diagonally, which has practically the effect of reducing the size of the diaphragm for these pencils, by substituting for the circular hole an elliptical one, having its image or diameter equal to the diameter of the stop. Another reason is, that the edges of the plate are farther away from the lens than the centre, so that the focus is longer, and we all know that the longer focus a lens has, the less light it gives on the ground-glass with a given aperture. Yet another reason, and one which, we believe, is generally overlooked, is that even these enfeebled rays of light which form the edge of the image fall upon the plate diagonally, not perpendicularly, so that a given amount of light has a larger area of plate to cover.

The strength of a pencil of light passing through a diaphragm making any given angle with the axis of the lens will vary as the cosine of that angle or of half the angle of view. The distance between the equivalent focus of the lens and the plate will vary as the secant of the same angle; but as the strength of light varies universally as the square of the focal length, the light will vary from this cause directly as the square of the cosine, whilst it will once more vary as the cosine of the angle, on account of the rays striking the plate diagonally.

Multiplying all these together, we will find that *the illumination of any point of the image will vary as the fourth power of the cosine of the angle contained between the axis of the lens and the axis of the pencil of light which goes to represent that point.* In working this out, we have not gone to the refinement of taking into consideration the fact that the rays, when they pass through the diaphragms, are slightly bent out of their true course by passing through the first combination. This has the effect of slightly increasing the inequality of illumination.

To make plain the practical result of working out this law, we will give a few practical examples.

With an angle of 100°, the largest possible to obtain with any lens, the light at the corners of the plate will be only about *one-fifth* of that at the centre. With an angle of 90°, it will be about one-quarter. With 80° it will be somewhat less than one-third. With 60° (about the angle given by a wide-angle single lens) it will be somewhat more than one-half. With 50°, the angle of an ordinary single lens, about two-thirds. With 30°, the largest angle advisable in portraiture, about seven-eighths.

It is difficult to believe that there is so much falling off of light as this indicates, because the comparative darkness and want of detail at the edge of a picture are scarcely noticed. In fact, as the interest generally centres more or less in the middle of the plate, it may actually add to the effect. It is when a picture is taken in several sections, and these are joined, that the falling off of the "covering" power of a lens becomes evident, even when a very moderate angle is included.

◆

THE BRITISH ASSOCIATION.

The jubilee celebration has come and gone, leaving the recollection of one of the pleasantest meetings ever held under the auspices of the Association, and certainly one of the most successful. The number of members and associates attending at York exceeded 2,500, and all the entertainments were given on an unusually grand scale. Photography was indirectly referred to in the Sections, and many of the papers read were illustrated by photographs; but our art-science cannot be said to have formed the specific subject of any communication. The President, in his inaugural address, spoke of the creation of photography as one of the scientific advances made during the past half-century, and some of the pictures employed to illustrate Mr. Spottiswoode's lecture "On the Phenomena of Electrical Discharge" were photo-transparencies thrown upon a screen. Beyond this, and the fact that electric lighting was very fully discussed in the Mechanical Section, there was little to interest photographers. The undermentioned communications, bearing on collateral matters, will either find a place in our columns, or form the subject of brief abstracts in our next issue.

"Action of the Spectrum on Silver Chloride," by Capt. Abney; "On Photometry," by Sir William Thompson; "The Photographic Spectrum of Comet b 1881" (exhibited), by Dr. W. Huggins; "Some Colour Experiments," by Lord Rayleigh; "On the Colours of Spring Flowers," by A. W. Bennett; "An Improved Sunshine Recorder" by G. M. Whipple; "On Telegraphic Photography," by Shelford Bidwell; "On the Swan Incandescent Lamp," by J. W. Swan; "On Electric Lighting in Coal Mines," by Andrew Jamieson; "Quadriform Gaslights for Lighthouse Use," by J. R. Wigham.

These, together with discussions on the effects of light on animals, and development of the colour sense, introduced by the President (Sir John Lubbock), by Professor Tyndall, Dr. Montagu Lubbock, Lord Rayleigh, and others; and an exhaustive discussion of Professor J. Norman Lockyer's extraordinary theory of the decomposition of the elements, on the part of Professor Dewar, brought to a close a busy week's programme, which seems to have given general satisfaction.

◆

MY RIDE TO YORK.

BY WILLIAM COBB.

A journey from London to York in the days of Dick Turpin, whether performed on his Black Bess, or by any other of the then existing modes of locomotion, would have been considered an undertaking of considerable magnitude. But manners and customs have undergone marvellous changes since that enterprising individual astonished the natives with his daring exploit, and science has so far developed the principles of go-a-headism as to make it well nigh impossible for any one to withstand its influence, either physically or morally, under this altered regime of conditions. I found myself on the first day of September *en route*, not for the alluring fields of "the daughter of the [illegible]," but towards the great centre and focus of intellectual greatness. Now, I would not have it inferred from this fact that I lay claim to any special scientific attainments, or I might possibly find some one applying the line in Bloomfield's well-known poem of the village fair—"He only went to see the fun"—to myself; which, however appropriate, might tend to produce a slight disturbance in the mental atmosphere; but still what there may frequently be found a considerable proportion of that particular element mixed up with matters of the gravest scientific importance, and I have sometimes thought that it may perhaps act as a kind of condiment to make the dishes of heavy and solid matter more palatable and digestible than they would otherwise be. Perhaps this question may some day come in for a share of attention by the British Association—who knows?

Independently of its historical associations, rich and varied as they are, the dwellers in York may well be excused for the pride and reverence they manifest with regard to their fine old city, which seems as if for the nonce it had thrown off its beautiful garments of ecclesiastical solemnity, to don the habiliments of scientific dignity and splendour, befitting the occasion of the jubilee of the British Association, where this august body inaugurated its proceedings on Wednesday last by an address from its President, Sir John Lubbock. Possibly the fact of 1881 being the year of jubilee of this Association may account in a measure for the great and unprecedented influx of visitors which poured in from all parts of the kingdom to watch over and take part in its proceedings.

Next in order of succession, after the first Sectional meetings, followed a brilliant conversazione in the Assembly Rooms. This was attended by nearly three thousand persons. Here almost every branch of science found its representative, although it was very evident that electricity in its application to motive power, as well as to lighting purposes, occupied the lion's share of attention.

I may here state that Mr. Joseph Swan, of Newcastle, has lighted the picture galleries of the Exhibition building—the soft, pure, and steady light given from his lamps proving conclusively that it is specially suited for picture exhibition. The expression of this opinion was unanimous.

A highly interesting series of experiments were here conducted by Mr. Shelford Bidwell, by which he demonstrated the possibility of being able to produce a photograph by electrical agency, and transmit the same by means of the electric wire. Owing, however, to the crowded state of the building, nothing beyond a general idea of the proceedings could be obtained. Difficulties arising from the variations of temperature have yet to be overcome before satisfactory photographic results can be secured by the means just referred to, and it therefore remains to be seen whether anything of a practical and valuable nature will follow in the wake of these very interesting experiments. A paper possessing a vast amount of interest to those engaged in experimenting with bromide of silver was read at one of the meetings of the Chemical Section by Lord Rayleigh; it was there stated that the yellow ray as seen through the spectrum is a compound colour composed of red and green; in this state it is practically of little use for photographing where extreme sensitiveness is employed, but on passing it through two solutions, one of litmus, the other of bichromate of potash, the rays are decomposed, and a colour of pure yellow results therefrom; it is assumed, therefore, that by adopting this mode of procedure, photographers who are availing themselves of the superior sensitiveness of bromide of silver will advance a step. It will be remembered that Mr. A. L. Henderson exhibited a lamp, a short time since, in which were receptacles for holding different solutions through which he proposed the light should be made to pass; it is thus evident that he is working in the proper direction towards the desired end.

Other matters of photographic interest, amongst which I may mention the new metal actinium, were brought forward.

By-the-Bye.

THE OWNERSHIP OF THE NEGATIVE.

Although the question of ownership seems clear enough to the photographer, it is one, we fear, upon which we are still likely to have some controversy. Lawyers do not take the same decided view we entertain of the matter, and it is with the lawyers, we must remember, that the ultimate decision of such things always rests. After all, however, it is only upon facts the man of law gives judgment, and now-a-days photographers should be able to deduce evidence enough to secure them a verdict, at any rate, so far as ordinary portraiture negatives are concerned.

We ourselves have twice been consulted by lawyers within the past three months, on this subject of the ownership of the negative; and we are, moreover, glad to say that our arguments were deemed good and satisfactory. Whether they would have prevented litigation, if larger sums had been at stake, is another matter. One of our legal friends was very difficult of conviction, and he employed the well-worn argument about supplying a hundred address cards and an engraved plate for half-a-crown, in which case the customer gets not only the prints, but the plate whence they are produced. Why, asked our friend, should not the photographer do the same?—why should he not give the negative as well as the prints he covenants to supply? The answer to this is not far to seek. In the first place, you cannot quote an instance of any photographer advertising that he will supply a negative and a certain number of prints for a fixed sum; and in the second place, he usually tells you the price of "further copies," which is certainly an implied statement that he shall consider the negative his own property wherewith to produce further pictures.

But let us consider for a moment what sort of a bargain it is that the photographer makes. Two customers enter the reception room, and are shown certain specimens. Some are large, some are small, some are plain, some vignetted. Either a price list is put into their hands, or the attendant quotes the terms. Mr. A. takes up a cabinet vignette and says he would like a portrait of himself like that, and he is told he can have a dozen of them for two guineas. Mr. B. prefers a carbon enlargement; carbon, he hears, never fades, and he wants a picture to hang up in the library, large enough to be seen from the other end of the room. The enlargement is valued at three guineas, and he agrees to pay that sum for a picture of himself, similar in every respect to the one exhibited.

The bargains thus concluded, each sitter is asked into the studio, certain negatives are taken, and Messrs. A. and B., having approved of the proofs, in due time receive their pictures. But Mr. A. is told by a friend, who dabbles in photography, that if A. will procure the negative, he shall have a lot of prints for nothing. Thereupon A. goes off to the photographer, and asks for his negative. But the photographer hesitates to comply; he asks what negative is it that A. requires. "The negative from which those prints of mine were struck; it is mine, since I paid you to take my portrait." The photographer replies promptly that he has not taken one negative, but six, in order to get a satisfactory picture, and asks if the customer lays claim to all of them. "No," says the customer, "but the portrait I paid for I want; it was necessary to take a negative, I know, in order to get the prints, and as you bargained to take my portrait, you ought to give it me." But the photographer bargained to do nothing of the sort; he showed his specimens—what does he have specimens for, if not for the purpose of exhibiting them as samples?—and promised to give pictures like them in return for a certain sum of money. If the customer had selected by chance ferrotypes, there would have been no negative to have, and indeed a photographer, so long as he produces results according to sample, is under no obligation to proceed by this process or by that. So long as he carries out the terms of his agreement to the letter, he has done all required of him by law.

But Mr. B.'s case more tritely shows to what a pitch of absurdity matters may go, if it is once conceded that the negative, or cliché, belongs to the customer, and not to the photographer. Mr. B. has bargained to give three guineas for a large picture in carbon, and he is likewise informed by a friend that the negative once obtained, any number of prints are to be produced at a nominal price. Here the photographer meets his customer's demand rather warmly, for if anything belongs to B., it is not a single piece of glass, but the original small negative, the positive transparency, and the enlarged negative. If B. is entitled to the last, it is equally certain he is entitled to the first and second as well. The photographer would be bound to give up all three clichés—or more, if more had been employed to get the finished result—if the customer had a legal claim on the negative; nay, if we go so far, it would be hard to say where the claims of the customer stop; the camera, the enlarging frame, the developing dishes, &c., &c., being all necessary for the finished result, would likewise be liable to be claimed; just in the same way as if A. had liked his portrait so much, that he ordered 5,000 to be printed off by Woodburytype, to illustrate his new work on *Typical Development*, and laid claim to all the transparencies and metal blocks from which they are printed.

But, on the other hand, is it quite clear that the portrait negative belongs to the photographer? He cannot do what he likes with it, can he? He mustn't print and sell copies without begging permission of the customer; and why does he beg any permission of the customer, if the latter has nothing to do with the negative? We answer, as a matter of course, that the negative, consisting of a film of silver upon glass, is most certainly the property of the photographer; not only this, but he does not hesitate to appropriate them. By far the greater number of negatives taken are re-used by him, the glass cleaned for further employment, the film thrown into the residue tub with other silver waste. It is only selected negatives that are carefully put away, serving for the production of further prints should the customer honour the photographer hereafter with future orders. The "permission" of the customer has nothing to do with the ownership of negative at all, but refers to another matter altogether, that of copyright, which justly forbids photographers selling portraits of personages without first securing the consent of the latter. All persons have a copyright in photographs of themselves, but they have no more right to the film upon which their features are impressed than they have to the lens and camera that help to impress them.

Whether photographers put the negative into a rack, or into the stripping trough, does not concern the public one jot; while, if the customer really had a claim upon the negative, he could sue the photographer for destroying it. The photographer preserves his negative quite on his own account; he hopes at some future time to get a further order for prints, from some proportion of his negatives, at any rate, and so goes to the expense of racking and registering the best of them. They are of no value to him whatever, except as dusty old glass, if the customers never come again, for, as we have said, even if they are of notable personages, he must not print copies without consent. But as the photographer has a better place for the preservation of negatives, knows best how to take care of them and to register them, he really does his customers a service in preserving their portraits.

We do not wish it to be inferred that negatives always belong to the photographer under any circumstances; that is nonsense. If at any time a gentleman or lady desires to possess a negative of this object or that—nay, if they were to enter any studio to-morrow, and were to prefer a request for a portrait negative—there would not be the least hesitation in complying with their wishes. Our object has been to show that under ordinary circumstances, where the bargain is to deliver a certain number of pictures, be they portraits, landscapes, or reproductions, the bargain is complete as soon as the photographer has handed over the specified prints of the required nature.

The "At Home" next week will be "Herr Hofphotograph Jos. Albert in Munich"; the following "By-the-Bye" will be "A Photographic Museum.

FRENCH CORRESPONDENCE.

Experiments with Sensitive Pellicle—A Good Developer for Gelatino-Bromide Plates—Importance of a Special Photographic Service in the Army and Navy.

Experiments with Sensitive Pellicle.—Our colleague, M. Stebbing, who is still pursuing his investigations on the preparation of sensitive pellicle, has succeeded, as already stated in my last letter, in introducing great improvements into the manufacture of these pellicles and their manipulations. As I attach very great importance to this pellicular process, on account of the numerous advantages which it is able to offer, I have myself engaged in exprimenting with this substance, after having learnt from M. Stebbing the different operations necessary to be carried out; and I am glad to say that my experiments have been attended with complete success. I have been really astonished at the simplicity of the operations, and at the ease with which they can be carried out, rendering this method a most convenient one for tourists and travellers. The weight of a pellicle of the dimensions 13 by 18 centimetres is hardly 5 grammes, while the average weight of a glass plate of the same size is about 120 grammes. As regards the space occupied, it seems scarcely necessary to institute a comparison between the two, since from fifteen to twenty pellicles placed on one another are not so thick as a glass plate. But, apart from these obvious advantages, we ought to take account also of the ease of transport and stowage of the pellicles, which, moreover, are unbreakable, if they are only placed between the leaves of a book made for the purpose. As I have already stated, my experiments were completely successful. The pellicles were exposed in the slide of the camera between two thin glass plates, and developed with ferrous oxalate. They were developed, fixed, and treated with alum in the same basin, and these operations were successively conducted without there being any occasion to touch the pellicle, and without any fear of breaking it. If it be wished to examine it by transmitted light, in order to observe the extent to which the image has come out, it is very easy to remove it from the different baths, provided only that this be done slowly and with some care. If it be done too quickly or too roughly, there may be some risk of cracking the film of gelatine which serves as a support for the emulsion; if these cracks do not extend to the emulsion, they reunite in drying, and do not show any more; but it is better to avoid them if possible, and nothing is more easy.

A Good Developer for Gelatino-Bromide Plates.—The following, as recommended by M. Stebbing, produces an excellent developer:—

A.—Water...	... ...	1100 grammes
Neutral potassium oxalate	...	300 ,,
Oxalic acid	... ...	1 gramme
B.—Water...	... ...	450 grammes
Pure ferric sulphate...	...	100 ,,
Sulphuric acid	... ...	2 drops
C.—Water...	... ...	100 grammes
Potassium bromide ...	...	10 ,,
Glycerine	... ...	10 cub. centim.
Sugar...	... ...	10 grammes

To develop a pellicle thirteen by eighteen centim., there must be taken of—

A	... ...	50 cub. centim.
B	... ...	15 ,,
C	... ...	3 ,,

After fixing, and the necessary washing which follows, it is well to pass the films through a solution of chrome alum. This solution is made of—

Water...	... ...	1000 grammes
Chromic alum	... ...	30 ,,

I hope that our excellent friend M. Stebbing will be able to make arrangements for the supply of his pellicles on a scale equal to the demand which is sure to be made upon him. In my opinion, gelatine as a support of the emulsion film is to be preferred to paper or any other kind of support which possesses less transparency. A sheet of gelatine is, in fact, like a plate of very thin glass, and does not possess a grain like paper, which is always apparent, whatever pains are taken to make it transparent by means of wax or oil, or some other method. By coating the two surfaces of the pellicle with a thin film of raw collodion, its keeping power will be perfectly assured, in spite of the damp. Treating it with alum is also an excellent means of preservation.

Importance of a Special Photographic Service in the Army and Navy.—The photographic art has now arrived at such a pitch of perfection, that all the departments of the State should, in my opinion, take advantage of the services which it is able to render. Up to the present, countries from whose advanced civilization we might have expected better things, do not seem to entertain the idea of placing at the disposal of their armies and their navies the resources afforded by photography. Perhaps there are some states where photographic processes have been placed under the control of a central department; but that is scarcely what I mean. I should like to see every army in the field, and every man-of-war on active service, equipped with all the necessaries for making photographic reproductions. A special service organized for this purpose in each regiment, and on board each ship, would soon be able to prove the value of my suggestion. Thanks to the introduction of sensitive pellicles, there will be no difficulty in carrying out this idea. Just as much as the transport of numerous sensitive plates and negatives on glass was formerly delicate and cumbersome, by so much is it now easy to equip oneself with an ample store of sensitive pellicles, and to use them for all the wants of the photographic service, if it were organized in the way I have indicated. I think that this plan might be greatly extended. If we were to place before our governments a complete scheme for an organization of this sort, pointing out the facilities which our art, up to the present so complicated, is now able to afford, I feel persuaded that we should induce them to make at any rate an experiment in this direction. I was talking the other day with a naval officer who had been appointed to a ship on the eastern station, whose duty it would be to visit the ports and rivers in Japan and Cochin China. "Why don't you take with you,' I inquired, "a simple and portable photographic apparatus? You would thus have an opportunity of utilizing your leisure hours, and of bringing back interesting recollections of your excursions." "That is true," he replied, "but I could not do it without authority, and they would rather see us drinking beer in the cafés of the ports that we visit, than allow us to amuse ourselves in a manner which would not only be instructive to ourselves, but productive of pleasure to others." There is, therefore, still much to be done to overcome the obstacles of red tape; still, the idea which I have suggested must one day be certainly carried out, thanks to the improvements which will render photography more and more simple and practical.

Leon Vidal.

Notes.

An early "At Home" will be "Fritz Luckhardt in Vienna."

The promenade or panel *format* ought to be called the Pesth portrait, so popular is it in the Hungarian capital. The other day, walking through its bright and busy streets, we noted no less than six studios, the staple work of which appeared to be this particular class of picture. By-the-bye, what a magnificent city Buda-pest, as it is now officially called, really is: the broad Danube, with its tree-bordered quays, is enough to make any town beautiful, even if archducal palaces, fine public buildings, and handsome squares did not abound. When its grand new street is completed, its opera-house, and modern church, Pesth will be almost as attractive as Vienna.

A correspondent says:—"In developing enlargements upon gelatino-bromide paper, a rich red tone may be secured by adding hyposulphite solution to the ferrous oxalate; a piece of the exposed paper cut from the margin will serve to experiment upon. Fifty drops of hyposulphite (strength, 1 in 200 in water) per ounce of oxalate will usually suffice." As reversal of the image is apt to accompany the "rich-red tone" in question, we advise our readers to take the suggestion *cum grano salis*, or, as chemists would say, with a pinch of sodic chloride.

Thin collodion makes a capital varnish for tin-foil. Travellers who pack dry plates in this material should bear the fact in mind, as tin-foil, unvarnished, frequently has minute interstices that admit damp.

"How to produce chromo-photographs — prospectus gratis," we saw in one of the Pesth shop-windows, so we procured a prospectus, but not the materials, which, in an "elegant" box, would have cost eighteen florins, or about thirty-one shillings. It appears, from the prospectus, that ever since the discovery of photography, "painters and portraitists" have been seeking in vain for a method of colouring camera pictures; the difficulty being now solved in the form of the eighteen florin box, these obviously may henceforth rest from their labours.

A casual inspection of the specimens submitted to us raised two points in our mind, to wit, how painters could have taken so much time to discover such a simple thing, and whether, after all, it was worth discovering. You take a convex glass, like a watch-glass—only, of course, more the shape of the unmounted print to be treated—and by means of an encaustic paste cement the print, face inwards, upon the under surface of the glass. You now see an unpleasant brown picture of a semi-transparent nature, if you look from the upper or convex side. To turn the photograph into a chromo-photograph, you then produce some patches of colour upon another convex plate, which is clapped underneath the first, and the pigments showing through, triumph at length crowns one's labours.

We saw Lichtdruck printing by machinery on the occasion of our visit to Herr Albert's establishment in Munich last week, the Schnellpress in action, printing at the rate of 800 photographs a day. We shall have something to say of this machine in our next "At Home."

Klic, of Vienna, is producing some very fine photo-engravings. "But then he is a first-class copper engraver," a Viennese photographer told us, when we commented upon their excellence. This circumstance would-be photo-mechanical printers should bear in mind. In the same way as in photo-lithographic or collotype work, it is not only necessary for the photographer to have the co-operation of a lithographer, but of one particularly skilful in his art, so it is only he who is thoroughly practised in all the niceties of ordinary engraving who is likely to succeed in photo-engraving.

We had the pleasure of meeting Dr. Hornig in Vienna, the well-known President of the Vienna Photographic Society. He was good enough to show us the historical collection the Society possesses, and which is, perhaps, unique in its way. Paris is in possession of archives of a similar kind, but notwithstanding the circumstance that early photography was especially practised in France, we doubt if the collection is so perfect as that over which Dr. Hornig watches, and which owes much of its completeness to his devotion and care. Here, in the Society's own rooms, we have early examples of Niepcotype, and of Daguerreotype, the first example of Lichtdruck by Albert, as well as specimens of the previous methods of Garnier and Negre. Here is a portfolio of pictures by Paul Pretsch, and examples of early Woodburytype. Talbotypes are represented, and pictorial work by "When the Day's Work is Done," Mr. H. P. Robinson's well-known picture, which has a post of honour on the walls.

What a difference it makes, to be sure, how you are received in a studio! We have had some experience of reception rooms throughout Great Britain, France, and Germany during the past two years, and we should very much like to set them down here. True, our visits have been made for journalistic purposes, but at first, at any rate, this has been unknown, and we have been able to form a very good estimate of the value of the assistant's services to his principal. If only some photographers would pay more attention to this important branch of their business, we can assure them it would be well worth while.

"What a dreary place London is on Sundays!" has been a frequent complaint to us in our recent tour through Austria and Germany, by those who have at one time or other honoured us with a visit. No doubt, it is sad to our neighbours, stranded on a foreign shore, to find amusements closed against them, but the unpleasantness of the situation is not altogether unalloyed. "This studio is not open after one o'clock on Sundays," is an announcement to be seen in many of the first-class studios of Berlin. In England, if we do not play on Sundays, neither do we work.

Topics of the Day.

ON PHOTOGRAPHERS.

BY A SITTER.

Being one of that conglomerate body—the "general public"—I have, as a matter of course, had my photograph taken. Indeed (if the joke may be pardoned), I am a sitter of "long standing." The smell of collodion is familiar to me; the camera and lens no longer make me uncomfortable lest they should go off; I have grown accustomed to the disappearance of the photographer's head between the pall-like focussing-cloth; I know the head-rest with the defective screw, which, at the most crucial point of the sitting, slips, and allows the rod to go down with an alarming bang, to the great injury of the nerves; I am perfectly well acquainted with the entertaining tome—generally an odd volume of the *Nautical Magazine*, *Zimmerman on Solitude*, or something equally humourous—in which I am in my photograph supposed to be deeply interested, and over which I am requested to "look pleasant." I am well versed in all studio chairs, from the twisted leg and nobbly back order, to the fearfully-constructed genus which, I am given to understand, can be transformed into a sideboard, a whatnot, a davenport, or a piano at a moment's notice. I have learned to shiver at the balustrade and pillar, so suggestive of a grim mixture of Waterloo Bridge and Kensal Green Cemetery. Knowing all this I deem myself somewhat qualified to speak of photographers.

My earliest recollections of the gentlemen who practice photography (by the way, why do photographers, like doctors, always "practice"—do they never become perfect?) are identified with velvet coats, slouched felt hats, and a superfluity of hair. At the time I am writing of it appeared absolutely necessary in order to take a photograph properly, you had to get yourself up in a costume something between an organ-grinder's and a brigand's. Doubtless there was a good reason for the velvet coat, and the slouched hat possibly could be defended—but why the enmity to razors and the scissors? Somebody whispers that one of the earliest Daguerreotypists of note was named *Beard*, and, therefore—but this reason is altogether absurd, and unworthy the pages of the Photographic News. But, be the reason what it may, I notice the photographer of to-day is not so hairy as he once was; the velvet coat has disappeared, and he has frequently been seen in a stove-pipe hat; but in other ways he has not changed.

I admit that there are some men who have the tact to put you at ease; but these are exceptions. I can call to mind a gentleman who, from the time I entered the studio to the time I left it, addressed but three words to me, and those words were, "That will do!" uttered as he emerged from the dark room, wiping his hands on a towel, and giving me the sensation that I had just had a tooth drawn. I have that portrait in my album now, and I call it my "cold drawn photograph." It is the perfection of minuteness. Every hair, every line, every freckle are faithfully reproduced, and all this, added to the stony glare of a Sphynx, make up a picture quite unique, if not cheerful. But all photographers are not of this petrified and depressing order. There is the gentleman who goes in for extreme liveliness, and is always impressing upon you the necessity of sitting easily. In order to secure this he will fuss round you, sticking this leg out, pushing that arm in, folding up the fingers of the right hand, unclasping those of the left, twisting your head first to one side and then to the other, and making you feel as if there was a "screw loose" in your anatomy. This gentleman has also an aggravating way of rushing at you at the very last moment just when you think you cannot hold out more than two seconds, and altering the whole arrangement, and altogether so fidgets and tires you with his indecision that utter weariness takes possession of your countenance, and is perpetuated to your own self-abasement, and to the reproach of your friends who pester you with the tiresome and unanswerable question, "Why did you look so miserable?" But worse than the "inscrutable" and the "undecided," is the "callous" variety. This gentleman looks upon you as a nuisance directly you enter the studio. You sit down nervously on the property chair with the high back, and are grateful for the property volume which the "callous one" presents you with. He does not trouble to alter your position, neither does he request you to "look pleasant"—though this latter, it must be said, is in his favour. The picture he takes is a sort of pot-luck affair. You pay your money, and you take your chance. The likeness may be good, but more likely will be bad. And there is always a probability of something spoiling what might otherwise have been a decent picture. Either the head-rest shows by the side of your neck, or that defect in the background which is always going to be rectified and never is, accommodatingly plants itself by the side of your nose, or your hand, being awkwardly placed in shadow, has two of its fingers abruptly cut off. And the worst of it is, the callous one does not care to make his defects good. The work of the "inscrutable" is generally good, if coldly mechanical; the "undecided" is so anxious to please, he will go on again cheerfully enough; but there is no hope from him of the callous (and careless) nature. I suppose photographers' tempers are occasionally sorely tried; but why—Oh! why—should they be so sensitive under any criticism from an artistic point of view? The worse the artist, the more dangerous to find fault with the pose, the lighting, and the arrangement. Another curious notion is, that because the photograph is good in its manipulation, it is also good as a likeness. "Yes," I am willing to allow, "the lighting is perfect—the high lights are charming; there is every gradation to the deepest shadow; there is not a pin-spot on the picture—all is clean, bright, and beautifully burnished; but I don't like it." For this I am called "troublesome." I have heard photographers speak of "troublesome sitters;" but I make bold to say that in the majority of cases the sitter has cause to grumble. My nose is tip tilted, and I am taken so as to show off my distinctive feature in all its glory. I am round in the face and with a mouth as wide as a church door, and I am rendered broadside on. I am of a pale complexion, and I appear as swarthy as a negro. On this question of the "white face" a feud has long existed between the photographer and the sitter; but I hold that the latter has the best of the argument. I have seen in the Photographic Exhibition numbers of portraits of persons with complexions of the hue of slate pencil dust, sitting under a coffee-coloured sky, and supposed to be in the full light of day, and have greatly marvelled thereat. I am not talking of shadow, which is one thing, but of what should be the lighted side of the face, which is another. The "troublesome sitter" asks the question: "But what makes that shade over the face?" and straightway the red rag is held out to the photographer.

Looking over what I have written, I am inclined to think I have been indulging in a "growl," and it is only fair to say that there is another side to the picture, and that I have met with photographers by whom I have been neither petrified, wearied, nor bullied. But in my experience, as I have said before, these are exceptions, and not the rule.

FRILLING.

BY RAGY.*

The subject of frilling in gelatine plates is interesting, and I venture to say, although much has been written regarding the same, none of the writers have quite hit the mark.

I know that the usual panacea is to add alum to the emulsion. This, I will admit, is the best remedy if properly applied, but the method of adding a few drops just before coating is most unscientific There are two sources of frilling caused by the gelatine:

---

* A communication to the Thursday Evenings for Photographers.

one when a large amount of hard gelatine is employed in making emulsion, and the other is where a very soft sample is used; the latter is not frilling proper, but more a melting of the gelatine, and is the one to which I more particularly wish to confine my remarks. Hard gelatine frills on account of its rapid expansion when moistened on one side only; the cure in this case is to reduce the quantity. I have come across samples of gelatine with such strong setting powers that two drachms, when cooled down with ice, sufficed for fifteen ounces of emulsion; in that case, unless the plates were thickly coated, frilling was almost impossible.

The softest gelatine may be used very successfully if treated with alum. I find the best way is to add alum to the emulsion before setting and washing, so that when the alum has played its part the surplus is removed. If the alum is added just before coating, crystallization when drying is set up, and the moment the developer reaches the plate the deliquescent or solvent action of the alum will cause a lifting of the film. There are one or two other causes of frilling which are not due to the gelatine, viz., imperfect elimination of the soluble salts, whereby crystallization is set up in the same manner as with the alum; another is the imperfect drying of the prepared plates. The latter is easily distinguished by the frilling of the gelatine all round the glass to the extent of about a quarter of an inch; the cure in this case is to perfectly desiccate the film. Frilling will also be engendered by decomposition being set up in the negative by imperfect washing between the application of the alum and the hyposulphite of soda, or *vice versa*, thereby liberating gases; last, but not least in importance, is the change of temperature in developing, washing, and fixing solutions. If a plate which has frilling tendencies be removed from a cold solution to a warmer, the changes of frilling are increased; yet you may allow the negative to remain in the colder solution till it becomes considerably warmer, so long as the change is gradual, without liability to frilling.

◆

ROYAL CORNWALL POLYTECHNIC.—LIST OF AWARDS.

The following is the list of awards at the Royal Cornwall Polytechnic Exhibition. A full report will appear in our next issue.

Section I.—Professional.

J. Chaffin and Son	2nd	Silver	Medal
Morgan and Co.	1st	Bronze	,,
W. Gillard	1st	Silver	,,
R. Harris	1st	Bronze	,,
Silverton Parry	1st	Silver	,,
A. Hendrey	2nd	Bronze	,,
Byrne and Co.	1st	Bronze	,,

Section II.—Amateur.

G. F. Williams	1st	Silver	,,
J. G. Horsey	2nd	Bronze	,,
C. V. Shadbolt	1st	Bronze	,,

Section III.—Photographic Appliances.

V. P. Jackson	2nd	Silver	,,

◆

ACTION OF THE SOLAR SPECTRUM AND CHEMICAL DEVELOPMENT ON SILVER CHLORIDE.

BY DR. EDER AND CAPTAIN PIZZIGHELLI.[*]

Schultz-Sellack exposed a moist chloride of silver collodion plate to the solar spectrum, and developed with an acid iron solution, the result being an action from close to the line N in the ultra-violet to a point a little beyond H in the violet.

H. W. Vogel made a series of experiments with silver chloride collodion dry plates prepared by the bath method, and developed by alkaline pyrogallic acid. He found that, under similar circumstances, it was necessary to expose the chloride plates to the action of the spectrum two and a-half times longer than in the case of bromide plates. In one case he obtained an action from H in the violet to B in the red; while in another instance the photographic effect of the spectrum extended as far as L in the ultra-violet.

Our own early experiments on this matter were performed at an unfavourable time (end of 1880 and commencement of 1881), and the consequence is, that we are not in a position to discuss the subject as fully as might be desirable; but the following particulars may, however, be regarded as throwing some light on the subject.

Chloride of silver emulsion which has neither been digested nor treated with ammonia shows the maximum of action (experiment made about noon in March, 1881) at a point between F and G, but somewhat nearer to G than to F (F $\frac{2}{3}$ G). In the case of certain experiments, the maximum of action tended a little more towards F, but it was always nearer to G than to F; and our recent experiments confirm the view that the maximum of sensitiveness is tolerably constant.

This tolerable constancy does not, however, hold good with respect to the relative action of the various colours, as the colour sensitiveness varies according to the way in which the emulsion has been prepared and the plates are developed; these circumstances having a very notable influence on the energy with which the red rays of the spectrum act.

The relatively greatest sensitiveness for the red rays of the spectrum is possessed by a chloride of sodium or a chloride of ammonium emulsion, while the calcium, strontium, and cadmium emulsions are less sensitive to the red and yellow radiations.

The most extended spectrum as regards the red end is obtained, other things being equal, when a ferrous-citrate developer containing some hyposulphite is used; and under these circumstances we obtained notable action as far as the red, just as Vogel did with an alkaline pyrogallic developer.

We may sum up by stating that we find chloride of silver, when in the form of a gelatine emulsion, to be markedly less sensitive than bromide to the red and yellow rays of the spectrum, and it is necessary to give a longer exposure in order to photograph the yellow on silver chloride than to secure an image of the red on silver bromide, the time required for obtaining a good spectrum in the blue being taken as unity in each case.

We hope to throw further light on this question by fresh experiments.

◆

THE USES OF GLASS IN PHOTOGRAPHY.

BY THOMAS GAFFIELD.[*]

The universal use of glass in all the arts and sciences finds no exception in the interesting art of the photographer. By glass he illumines in right degree his studio, and admits a few rays into his dark room. Glass bottles contain his chemicals, and with glass dishes and retorts he carries on his nice chemical manipulations. With glass lenses and plates he pictures the landscape and portrays the face of man, and enlarges it to the size of life or reduces it to microscopic form.

Paradoxically, and yet truly, we may say, glass is of most positive value in the very negatives which it brings to his hand.

Concerning all these departments of use, many pages have been written in photographic magazines and manuals, and only a few comprehensive words need be spoken now. Asking your indulgence, if my essay is in any measure to some of you a twice-told tale, I will try to be as brief and as clear as possible.

Glass for Skylights.—For skylights you should use double thickness of good and clear sheet glass. You will make no mistake if you purchase first or second quality of English, French, or German; and, where our American manufacturers do so well in improving the quality of their production as to make well annealed, flat, clear, and good coloured glass, then you will be more patriotic if you patronize them. As a Massachusetts man, I am glad to say a good word for the excellent Berkshire crystal sheet glass, made of the famous white Berkshire sand. The evil of rust or stain, arising from an excess of alkali in the composition, or haste in the manufacture, and the trouble of a change of colour by the action of sunlight, by reason of an excess of manganese, have received so much consideration within a few years, that good glass makers, at home and abroad, have done their best to remedy them, and produce glass of substantially good quality and permanent colour.

As you may need all the light possible to obtain in a dark day, I should advise that all skylight glass should be used in its clearest condition, unobscured by grinding or enamel, which cut off about one-half of the light of the sun. But as you may need on a bright day to shut out brilliant and dazzling rays, accomplish your object entirely by screens and curtains of appropriately light or heavy character, as your location or the nature of the day may require.

---

[*] Extracted from the Author's new work on "Photography with Gelatino-Chloride of Silver Developed by Chemical Means."

[*] A communication to the Photographers' Association of America.

Do not be misled into the use of coloured glass in your skylights by any foolish, unscientific, and untruthful theories about blue, or violet, or any other kind of coloured glass. The lightest blue glass, although the most actinic of all the coloured glasses, will cut off more of the chemical effect of sunlight than the darkest colourless glass found in commerce, even if be it deteriorated by the action of sunlight. Therefore, I say, be independent in your studio on dark days by having all the light which the clearest colourless glass will admit, and be independent on bright days by a skilful arrangement of your screens and curtains. And keep your glass clean, as dirt may obscure it almost as much as grinding or enamelling its surface.

I might say here, that in some locations, as where a studio is shut in between other buildings, ground glass may be used to advantage, perhaps, for some portion of the side lights, because while it cuts off a considerable portion of the light, it diffuses what is left in such an excellent manner, that the room may be on the whole better lighted than by the use of unground glass. Every little point of the ground surface becomes a minute facet or lens to transmit the light into the distant portions of the room.

Glass for the Dark Room.—The problem for the photographer here to solve is to admit light enough to enable him to perform his work comfortably, and to shut out enough to prevent the fogging of his most sensitive plates. There have been a great many experiments tried in the way of using two or three thicknesses of yellow or orange glass, or yellow, orange, or red coloured paper. But red paper is too opaque, and yellow glass transmits too much of the chemical influence of sunlight. There has been a very general opinion among photographers, and it is wrongly published in some scientific books, that yellow glass cuts off all actinic influence, or more than any other colour. The fact is, as proved by experiments, whose results I shall show you, that yellow transmits more chemical effect of sunlight than any other colour except violet or blue. The exact actinic order is as follows: red cuts off most, orange and green come next, yellow follows fourth in the list, violet transmits more than yellow, and blue transmits most of all.

So, if you would be safe against fogging, you must use the red or ruby glass. But it is a serious objection against it that it is too dazzling to the eyes of the operator. A very successful remedy for this was suggested to me by Mr. Augustus Marshall, of Boston, in the grinding of the colourless surface of the glass. It gives the glass the appearance of a deep orange hue, removes the dazzling effect, and while it cuts off a portion of the light, diffuses what is left in a greater degree than the unground glass. As there are many tints of red glass, I might add that the effect of a dark tint, where you cannot readily procure it, may be produced by using two thicknesses of a lighter hue.

Glass for Negatives.—For negatives, the artist needs for good work glass of ordinary strength and thickness, and free from waves and blisters. Perfection of clearness and a perfectly level surface are only to be obtained in the finest plate glass, but as it costs four or five times as much as good sheet glass, it is but seldom used by our photographers. We know one who used it some years ago, who afterwards substituted successfully a very superior article of clear and light-coloured glass, called the Berkshire crystal sheet.

The best quality of single thickness of English or Belgian sheet glass (the Belgian is called French in New York, and German in Boston) is always excellent for negatives, and formerly was almost wholly used for this purpose. But we are happy to say that some American glass-makers have of late years greatly improved their quality in regard to colour, clearness, good annealing, and consequent strength and toughness. We can cheerfully recommend Berkshire crystal sheet, the glass referred to above, and any other kind which approaches it in quality. Of course, it is easy for any manufacturer to improve or deteriorate the quality of his manufacture at any time, and our recommendation would not apply to any article which should not be kept up to the standard named. Any photographer can easily tell, after the trial of a box, whether it will be necessary for him to sacrifice his patriotic desire to patronize home manufactures and to purchase the foreign article, which is always up to the mark. If an artist desires thicker glass than single, which is from one-twelfth to one-fourteenth of an inch in thickness, he can buy what is called double-thick by paying about fifty per cent. more.

In taking what are called porcelain pictures, opal glass is used, which is made in Massachusetts and New York, and also imported from abroad.

Glass for Lenses.—Without deciding for you who is the best manufacturer of lenses, I will make a few remarks on their proper care and keeping. They should be kept clean and entirely free from dust and moisture upon their exterior surfaces, and the connecting interior surfaces of the crown and flint glasses. Any neglect of this precaution will cause much delay in the taking of pictures. When not in use they should be covered up and kept out of the sunlight, which might give them a yellow colouration, which would essentially weaken their action. In some instances where lenses seem to be affected, the change may be traced to a discolouration of the Canada balsam, or the substance by which the crown and flint glasses of the lens are cemented together. In such a case the difficulty can be remedied by taking them apart, and giving both glasses a thorough cleaning, and a new transparent layer of cement.

Mirrors for the Solar Camera.—The sunlight, which is the central source of power and success in all your work, sometimes by its very power interferes with your success. The ordinary mirror, made by a coating of tinfoil and mercury, which are held together by slight affinity, is quickly disintegrated and frosted by the light and heat of the direct rays of the sun. By actual experiment made in July of the present year, on the outside of my attic window, I have found this deteriorating influence to begin on the first day of its exposure. Exposure inside of the window did not affect the glass for some weeks.

There are several methods of making mirrors by a precipitation of metallic silver upon the surface of the glass, backed up with a coating of red or black paint or varnish, or some other protecting substance. Many of these have proved failures, the silver surface becoming quickly spotted or spoiled for reflecting purposes. But I have found some specimens which have stood several months of exposure inside of my window without any change. Outside exposure to sunlight and rain of course injures some of them in a short time. But if you can protect them from moisture, some of these silvered mirrors will stand better than the amalgam mirrors of mercury and tinfoil. I can only say that you must make the same experiments which I have, until you find a kind which withstands best the deteriorating effect of the direct rays of sunlight. The thin mirror plates are preferable to thick ones, which sometimes give trouble by reflection from both surfaces.

Glass for Chemical Bottles and Dishes.—For keeping your very sensitive chemical preparations with certainty from any danger of change or deterioration by sunlight, bottles of a yellow glass will not suffice, but only those of black, red, or dark green colours; the red and black, of course, being safer than the green.

For your glass dishes, be sure to procure glass well annealed and of sufficient thickness. For retorts, and indeed for all photographic glass, avoid uncertain and dangerous experiments with the so-called, and falsely-called, unbreakable glass. The fact that it does break, and breaks unexpectedly and with sad effect, is what might be predicted of an article which, though an interesting and scientific curiosity, is really only an unannealed Prince Rupert's Drop on a large scale. That I may substantiate my opinion by fact, let me read you two articles published in the journals of the last few years. The first is from the *Philadelphia Photographer* for June, 1876. Mr. Edward Stebbing writes from Paris:

"Much has been said upon the value of hardened glass for photographic and chemical purposes, but I advise my readers to be very careful in its employ, for it appears that no guarantee can be given that evaporating dishes, &c., can always resist heat. I desired to experiment, the other day, upon the value of this invention, and purchased an evaporating dish and filled it with a concentrated solution of nitrate of silver in order to procure crystals of that salt. I put it over a Bunsen burner, but took the precaution to put the whole into a large dish. Happily that I did so, for in a few minutes the bottom of the evaporating dish flew into a thousand pieces, and the liquid was projected out in a second of time. A thousand pieces is a true expression, for the bottom was honeycombed in every direction. Now, had I taken an ordinary glass dish, and it had cracked, ten to one I should not have had a loss, for the liquid would have only filtered through the crack and given warning, whereas hardened glass does not crack, but flies into small pieces without giving any previous notice."

The following is from the *American Pottery and Glassware Reporter* for June 16, 1881.

"A serious accident has lately befallen an apothecary of Nuremberg, Mr. Weigle, who was preparing ozone, and used for this purpose a retort made of toughened glass. The latter suddenly exploded with a tremendous detonation into minute fragments, cutting an artery and several tendons in Mr. Weigle's hand, and also injuring his apprentice. It seems about time to banish toughened glass utensils from chemical or pharmaceutical laboratories."

The Comparative Power of Coloured and Colourless Glass to Tranmit the Chemical Influence of Sunlight.—I might close here, but as I have never before addressed a national convention of photographers it may interest you to hear a word of some humble experiments of mine illustrating the comparative power of colourless glass, ground glass, and differently coloured glasses to transmit the actinic rays, or more properly speaking—as all rays are more or less actinic—to transmit the chemical influence of sunlight. The general results of the experiments prove—

First. That the clearest specimens of colourless glass cut off an appreciable portion of the chemical influence of sunlight.

Second. That the obscuring of colourless glass by enamel or grinding off its surface cuts off a large proportion of this chemical influence.

Third. That the darkest-tinted colourless glass sold in commerce cuts off less chemical influence than the lightest tint of any coloured glass.

Fourth. That the coloured glasses cut off the chemical influence of sunlight in the following order: Red cutting off the most, orange and green coming next, yellow following, violet transmitting more than the yellow, and blue transmitting most of all. I have already spoken of the practical application of these results in my remarks on glass for the studio and dark room. I have brought to illustrate these results a number of photographic sheets showing the effect of sunlight on sensitive paper under colourless and ground glass, and under coloured glass of different colours after exposure varying from one minute to four hours.

(*To be continued.*)

Correspondence.

CHLORIDE OF SILVER *VERSUS* BROMIDE OF SILVER IN GELATINE EMULSION.

Sir,—Within the last few days I have unexpectedly happened upon some of my comparative trial plates of bromide and chloride of silver, which I had thought were stowed away in the inaccessible recesses of a furniture warehouse.

There are two sets of three plates each, and in each case there is a bromide plate, a bromo-chloride plate (equal parts bromide and chloride emulsion), and a chloride plate. In the emulsions the same quantity of gelatine and of silver nitrate were used.

All the plates were purposely much under-exposed in the camera to a shady and non-actinic subject. The exact exposure I cannot now remember, the note-book containing this record being in the aforesaid warehouse. However, this is not a point of much importance; suffice it to say that all the plates were exposed as nearly as possible under equal conditions one after the other.

The first set were exposed in the moist state, not having been dried; all were fully developed together in a dish by the alkaline developer, the formula used, and noted on the plates, being that recommended for use with Kennett's gelatine plates. In this instance the apparent sensitiveness of the plates, as indicated by detail, is as follows: Chloride first; bromo-chloride next; bromide decidedly last. In the second set, the plates having been dried, the order of apparent sensitiveness is different, for the bromide and bromo-chloride plates are about equal, the bromide plate apparently having a very slight advantage in the more non-actinic portions, while the chloride is rather in advance where the light has proceeded from the surface of ivy leaves. The bromo-chloride plate is decidedly behind the others; but probably this is an abnormal result. The superior sensitiveness of the moist chloride over the same in the dry state may, perhaps, be due to its property when moist of absorbing more of the less refrangible rays.

These plates have not been fixed, and the sensitive salts remain much in the same condition in which they were about five years ago. No precautions were taken, such as are now employed, to ensure cleanness of film; yet, though in some mechanical respects the films are far from perfect, there is no green fog or other staining of the film.

I may mention that staining and green fog did not trouble me in those days. My difficulties were of another nature—viz., frilling and blistering. The former evils constitute the present epidemic; but I think I see a way of avoiding them in my own practice.

These plates show the practicability of developing chloride of silver by means of the alkaline developer. It may be noted, too, that the development was forced, and the developer by no means a weak one.

If Captain Abney should take an interest in examining these plates, I would be pleased to take an early opportunity of showing them to him. The sight of examples of experiments is often more satisfactory than columns of reading about them. It must not be supposed that these plates constitute the whole of my experiments—many others were made. I had a set of iodo-chloride plates, but, as far as I remember, they were in some way not so successful, being, I believe, foggy from some cause or other.

My opinion as to the use of hydrosulphite of soda for chloride plates is based upon the following facts:—Silver chloride in gelatine can be developed by the alkaline developer. Silver chloride in albumen cannot be developed by the alkaline developer, but it can be developed by hydrosulphite of soda. This being so, how much more, then, could hydrosulphite be employed for development of the chloride in gelatine, which will even bear alkaline development?

I made a few trials with collodio-chloride emulsion, prepared with excess of silver and washed—*not*, be it noted, the kind of emulsion mentioned as not suitable by Captain Abney in a recent paper. The film gave a deep brown fog when treated with hydrosulphite. A coating of gelatine improved matters, or, rather, delayed reduction, as also did sulphate of ammonium; but I failed to obtain an image. It might be advantageous to use an emulsion prepared with excess of chloride. With a very mild developer greater success might be looked for; but I am afraid this success will be but a partial one, judged from the utilitarian and ordinary standpoint of general sensitiveness. I am, however, inclined to think that the highest degree of sensitiveness will be obtained by using a strong physical restrainer, such as gelatine, and the most powerful form of developer possible; for as the abnormal reducing action of the developer is lessened—beyond a certain limit—so will its power for searching out detail be crippled.—I am, sir, yours faithfully,

Herbert B. Berkeley.

TARDY EXECUTION OF ORDERS.—EMULSION MATTERS.

Sir,—In your number of the 22nd July, I see there is a letter from Mr. C. E. Elliott, expressing his shame at being connected with the wholesale photographic trade, in consequence of sundry complaints of the delays experienced in getting orders executed.

In reply to his query, I can only say that the firms to whom I applied are doubtless recognized by everybody as eminently respectable and trustworthy. I do not care to give their names for publication, as I do not think for a moment that the delay was caused by anything else than laxity of system, or perhaps carelessness of employés. However, sir, for your own information, I append the names, and I think you will agree with me that these names should be quite sufficient guarantee for thorough business principles.

I would also state, for Mr. Elliott's information, that these orders were in all cases sent by me direct to the parties concerned, and that no merchant or agent has anything whatever to do with them.

Since writing the first letter on this subject, I sent an order (on the 19th June) to another firm for twenty dozen gelatine plates and some chemicals: the money was sent by the same mail, as the party advertises in your journal special prices for "cash with order only." I not only sent enough money for the goods, but enough to cover packing charges, &c. I particularly asked for a speedy reply by return, but up to-day have heard nothing. My letter must have reached London by the 10th July, and the mail received here yesterday left London on the 22nd July, so that twelve days have passed without anything being done.

Considering the advertiser lays such a stress on "cash with order only," one would think he keeps a stock of each kind of plate specified, and that he would comply with orders at once, as we might reasonably expect, after paying cash in advance. There may be some unknown good reason for the delay, but it seems to me that go where you will, the same practice obtains. My orders have been sent off in January, March, June, and July, so press of business cannot always be the excuse.

Your issue of the 1st July last contained an account by Captain Abney of a method of making gelatine emulsion and coating plates during the recent hot weather in England. A very similar plan to the one described has been tried over and over again here in Madras by another amateur and myself, but I cannot say we have met with the slightest success. By the free use of ice both under and over the coating slab (glass), we have just managed to get the films to set; but as soon as they are put away into the drying box, the emulsion melts again and runs off the plate.

The heat here is certainly much greater than that mentioned by Captain Abney. In our darkrooms in the daytime it is generally over 100° from 11 a.m. to 5 p.m. for six months in the year, and I may say never goes below 80° even at night. It seems to us that the moisture left in the gelatine causes the re-melting, for although the current of air passing through the box is warm and dry enough, it does not appear to sufficiently absorb the moisture from the plates. We have tried precipitating the emulsion in alcohol and re-dissolving the pellicle in acetic acid and alcohol, but our experience is that more acetic acid than alcohol must be used, or the gelatine is again precipitated. We have noticed that writers in your paper say that from 4 to 10 c.c. acid to 50 c.c. alcohol is an average proportion; but we find that 80 c.c. acid to 50 c.c. alcohol is nearer the mark in this climate. The films we get from the resulting emulsion are very thin, and in a good many cases require intensification to produce anything at all brilliant or well contrasted; but we can now coat our plates, get them dry within an hour or two, and develop, without iceing all the solutions.

I see in your number of the 22nd July, "A Country Photographer" asks about Vogel's emulsion. I cannot understand how it is not procurable at home. I have already received a batch from Messrs. Rouch and Co., and find it the greatest convenience possible in this country.

I send a rough print of a group of the native and East Indian clerks of the locomotive department of the Madras Railway taken with Ross's Rapid Symmetrical Lens $\frac{f}{22}$ with two seconds' exposure. This shows a fair quantity of detail in the mass of white clothing, which is very difficult to take and get proper exposure of both that and the dark faces. Gelatine seems to greatly excel wet plates for such work.—Yours faithfully, F. Dunsterville.

GELATINE V. COLLODION.

Dear Sir,—Though up to the present a passive spectator of the paper warfare between the above factions, I cannot, if you will permit me, allow the battle to terminate without firing a shot in fairness to both parties. That collodion is far cheaper to those who make their own plates—amateurs especially—no one can, in reason, deny; in fact, Mr. Henderson has most indisputably proved that, if there is any meaning in facts and figures.

On the other hand, when we come to the question of cleanliness, expediency, and comfort, then collodion has to give way at once to its adversary. They have each their respective virtues, and also the idiosyncratic failings. No advantage can exist without a collateral disadvantage.

I do most heartily agree with Mr. Henderson as regards prices of dry plates. No dry plate maker can possibly put plates into the market at the prices some are advertised, and make profit on them; on the other hand, they must lose money on the transaction. When we rush into print we may as well know of what we are talking (or writing). I refer to the estimate given for coating 1,535 plates. We will call the number 130 dozen. I shall be able to find work all the year round for any individual who can, and will, coat, examine, and pack 130 dozen quarter plates for 10s., and moreover I will give £5 to any person who will furnish me with the method by which this extraordinary amount of work is accomplished. I should fancy the films of which the author of "Odd Jobs" complains were put on (I will not say coated) by a method somewhat akin to the 130 dozen "tip." If photographers will pay a fair price for their plates, they can rely upon receiving even films without blemish or spot; if the reverse, they can return them. But if they pay an unfairly low price, they must put up with what they get. I have used some thousand of plates from various firms, and I have invariably found the higher priced plates the better. Had plate-makers observed a little unity, and not tried to undercut each other, the trade would have been more remunerative to both maker and purchaser. I do not intend to trespass further on your space, and I thank you very much (for myself) for the ventilation you have allowed the subject, as it is an important one, and I am sure you will agree with me when I say again, I do wish people would understand what they are writing about.—I am, dear sir, faithfully yours, A Photographer.

THE STAINING QUESTION.

Sir,—One very great objection to the pyrogallic development for dry plates is the uncertain density attained, owing to occasional staining of the film. This is entirely overcome by the addition of one ounce of saturated solution of washing soda to No. 1 stock bottle of the enclosed formulæ.

No. 1 Stock Soluion.

Liquor ammonia	1½ ounces
Bromide of potassium	1 drachm
Water distilled	12 ounces

No. 2 Stock Solution.

Pyrogallic acid	1 ounce
Citric acid	2 drachms
Water	6 ounces

Add ½-ounce of No. 1 to 14 ounces of water.
Add ½-ounce of No. 2 to 14 ,,

Place the plate in the developing dish without wetting it, and flow over it ½-ounce of No. 1 (diluted), then add ½-ounce of No. 2 (diluted), and the development will proceed rapidly. More or less of the above may be used as the case may require.—Yours, &c., Wm. Hall.

Brighton.

Proceedings of Societies.

Thursday Evenings for Photographers.

At the meeting held on the 1st inst., the chair being occupied by Mr. Cutchey,

Mr. Cowan exhibited and explained an apparatus for holding negatives, for copying, which he had constructed; the novelty in it being two metal diaphragms working one over the other by means of a friction-pulley, and adjustable for negatives of any size up to whole plate.

Mr. Ayres exhibited a camera the dark-slide of which was fitted with a curtain-shutter. He also brought a simple but efficient drop-shutter for stereoscopic work.

Mr. Brown exhibited an improvement upon the shutter exhibited by him at the last meeting.

Mr. Debenham explained a method of arranging the sizes of the diaphragms of lenses, and marking them, so that the amount of exposure required may be readily calculated; and he urged the necessity for opticians to make and mark the diaphragms of their lenses to one universal standard, which, he suggested, should be an ordinary quick-acting portrait lens, having the proportion of aperture of focus of one to four. The method is as follows:—Measure off on a piece of paper a base-line $16\frac{31}{32}$ inches long; mark the extremities of this line A and B, then at the extremity marked A rule a perpendicular line, which call No. 1; then rule other perpendicular lines at distances from the extremity B, of $13\frac{7}{8}$, 12, and $9\frac{13}{16}$ inches; number these $1\frac{1}{2}$, 2, and 3 respectively; then, by means of the compasses, halve the distances between these perpendiculars and B, and distinguish each fresh perpendicular with a number equal to four times that of the one the half distance of which is thus marked; now draw a line from the extremity B to a point on the perpendicular numbered 1. equal to $\frac{1}{4}$ the equivalent focus of the lens for which the diaphragms are required, and the heights of the perpendicular lines from the base to this line will give the openings for the diaphragms for that particular lens, each one requiring an exposure equal to the distinguishing number of the perpendicular line.

Mr. Harrison showed an improvement upon the compass arrangement shown by him at a previous meeting, which he used for the same purpose, the principle being analogous to that of Mr. Debenham's diagrams.

Mr. Haddon produced a rack for holding gelatine plates whilst washing or drying; it consisted of three wire uprights soldered together top and bottom in the form of a triangle; to the two of them forming the front small pieces of wire were soldered, and on these rested one edge of the plate, the film downwards, the other edge resting against the back or third upright. Thus the plates are held in a sloping position, one above the other, the rack being stood in a bucket of water whilst washing, then placed on the bench, or suspended for the purpose of drying, a thorough current of air passing between them. The great advantage with a rack of this description is, that once placed therein, the plates need not be again disturbed until ready for varnishing.

The Chairman, in proposing the usual vote of thanks to the exhibitors, &c., expressed a wish that some pressure could be brought to bear upon opticians, not only to adopt Mr. Debenham's suggestions, but also to adopt a universal thread for the flanges of their lenses, so that a lens of one maker should be interchangeable with that of another, thus saving the landscapist the burden of carrying so many fronts and adapters.

Talk in the Studio.

Group Portrait of Mr. Gladstone.—A very effective group, including the Premier, Earl Sydney, Countess Sydney, Mrs. and Miss Gladstone, has been forwarded to us by Mr. Perryman, of Deal, and we feel sure that the natural and characteristic attitude of the Premier will recommend the picture to those who wish to possess a recent portrait of Mr. Gladstone.

Photography on the Railway.—The Western Railway of France now requires each season-ticket holder to deposit a photographic portrait of himself with the Company.

A few sections of the British Association had to complete their business on Wednesday, and papers were read upon earthquakes in Japan, the wind pressure, the consumption of coal, and colliery explosions. Upon the latter subject Mr. Galloway stated that, having convinced himself by experiment of the inflammability of coal-dust, if water was sprinkled on the floor of dry mines before blasting, the worst of explosions would be prevented. The Committees entrusted with special branches of scientific investigation were reappointed, and grants were made in their aid. The proceedings of the meeting were brought to a close with cordial votes of thanks to the Lord Mayor and Dean of York, as representing the hospitality of the citizens, and to the President of the Association.

Nottage (London Stereoscopic Company) v. Aitken.—This was an appeal from an order by Mr. Justice Cave, directing service of the writ out of the jurisdiction. The Plaintiffs claimed damages of £5,000 against Messrs. Aitken and Fairlie, St. Vincent Street, Glasgow, for an infringement of their copyright in a photograph of the present Ministry. The defendants received an order from a Glasgow firm, Messrs. Thorne and Henderson, to print several thousand pocket-handkerchiefs with a copy of this photograph upon them, and the Plaintiffs brought their action against the defendants for the piracy, stating their damages at £5,000, and obtained leave to serve the defendants with the writ in Glasgow. The defendants entered an appearance, which they now alleged was a provisional one, and contended that under the Copyright of Designs Act, 25 and 26 Vic., c. 68, the action should have been brought in Scotland, as none of the acts complained of were committed in England. Mr. Marten, Q.C., and Mr. Mansel Jones appeared for the applicants; Mr. Pollard for the respondents (plaintiffs). Their Lordships allowed the appeal of the defendants, and set aside the writ of service, unless the plaintiffs gave an undertaking to confine their action to such cause of action as would be the foundation for service without the jurisdiction.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News*" *Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 3. Cash at the time of sitting: How I get it," to be sent in by the 1st Oct. No name need appear. For rules, see previous numbers of News.

L. C. Fenn.—It will not happen unless moisture be present.

Ferrotype.—We have never met with a case of fading when the conditions you refer to were properly fulfilled.

Dry Plate Novice.—1. All the information you require can be gathered from a leader published in the Photographic News for August 5th of the present year. You had better not meddle with the original negative, but sensitize your printing paper on a very weak silver bath, and print in a subdued light. Both plates are over-exposed.

Album.—1. It is merely necessary to send a drawing, and transmit the necessary fees; but you should make a search in order to ascertain whether anything similar has been previously entered. 2. Write to the office for a copy of the regulations.

J. F. F.—1. No doubt the best thing would be to make a new bath, and to recover the silver from the old one. 2. You should make use of a porcelain basin for the purpose.

R. H. Timperley.—There is not one at present, but we hope to announce something of the kind shortly.

Baynton and son.—Very good results were obtained with the plates you forwarded, and we did not observe that they required any unusual treatment.

Mystified.—1. The spots are more transparent than the ground, so they do not so much require removing as filling in. Nothing would be better than the usual retouching pencil. 2. Fresh albumen to which the usual proportion of ammonia has been added is as good as anything we know of.

S. F. Priestley.—The apparatus has been described in the present volume of the Photographic News, and any camera maker will construct it for you, no patent having been taken out respecting it.

Puzzled.—There appear to be two kinds of stain or marking, one being due to a trace of scum on the bath, and the other arising from defects in the paper itself.

Hoxton Amateur.—1. The most rapid plates often give thin images. 2. Increase the quantity of pyrogallic considerably, and the bromide to a less extent.

H. Osborne.—1. It will vary somewhat according to amount of water absorbed during the operation of washing, but about four ounces may be taken as an average. 2. Between two and three dozen.

J. F. Ryman.—A much weaker solution should be used; certainly not stronger than 10 grains to an ounce.

J. L. B.—1. It is no reproach to a scientific man that he fails to use the latest or most advanced names for chemicals in everyday use. 2. You certainly may write of "sodium thio-sulphate" instead of the old familiar "hypo." if you think proper; but you will run the risk of appearing pedantic to those who understand what is meant, and of causing others to take much unnecessary trouble in trying to obtain the "new" salt. Our laboratory boy once attended a science class, and the teacher, just fresh from Kensington, explained that only ignorant people speak and write of sulphuric acid; the elect calling it "hydric sulphate." The youth meditated and reasoned on this; the consequence being that next morning our gum bottle was found neatly labelled "Hydric gummate!"

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1202.—*September* 16, 1881.

CONTENTS.

	PAGE
Positive Pictures on Gelatino-Chloride	433
Photographic Furniture	433
The Electric Lighting at York	434
Judges' Report of the Royal Cornwall Polytechnic Society	434
Photography In and Out of the Studio	436
At Home.—Herr Hof-Photograph Josef Albert in Munich	437
Notes	439
The Concours Photographique at Ghent. By F. F. S.	440
The Uses of Glass in Photography. By Thomas Gaffield	440
Correspondence	441
Proceedings of Societies	442
Talk in the Studio	443
To Correspondents	444

POSITIVE PICTURES ON GELATINO-CHLORIDE.

First Article.

Last week we laid before our readers an extract from the theoretical portion of a new work on gelatino-chloride, which has been published by Dr. Eder and Captain Pizzighelli; and we now propose to give such practical details of the authors' methods as shall enable our readers to avail themselves of the excellent method put forward by these indefatigable experimenters.

Two methods of preparing the chloride emulsion are considered—the first method (without ammonia) yielding pictures which may be bright brown or reddish toned, according to the developer selected; while the same emulsion, if digested for twenty-four hours, can be made to yield pictures having a fine violet-black tone.

The non-ammoniacal emulsion is prepared much after the manner generally adopted for the production of a gelatino-bromide emulsion, the soluble chloride being contained in a warm gelatinous solution, to which the silver nitrate is gradually added, while the mixture is kept in continual agitation. Twenty-five parts of gelatine are dissolved in 200 parts of distilled water, together with 7 parts of sodium chloride, and 6·40 parts of ammonium chloride, it being convenient to allow the gelatine to swell for half-an-hour before applying heat. The gelatine being dissolved, and the solution at 50° C. (122° F.), a silver-nitrate solution containing 15 parts of the salt in 200 parts of water is gradually added with agitation; and it should be noted that it is advisable to warm the silver solution to the same temperature as the gelatinous liquid.

The chloride is deposited, under these circumstances, in a very fine state of division, and the mixture is at once poured out to set, a beaker or drinking glass serving very well as a mould, and external cooling may be resorted to when it is desirable to work expeditiously. The gelatinized emulsion may now be cut into strips by means of a horn spatula or a strip of glass; but if a more perfect state of division is desired, it may be forced, nutmeg-grating fashion, through a piece of wire netting. In either case the material is tied up in a piece of muslin, and is suspended in a vessel containing a considerable quantity of water, this being changed five or six times, unless a stream can be kept flowing through the vessel. The washing may occupy a period of six to twenty-four hours, according to the state of division to which the emulsion is reduced, the temperature, the frequency with which the water is changed, and other circumstances. This operation being satisfactorily finished, the emulsion is well drained, and is next melted at a temperature of about 50° C. (= 122° F.).

As regards the filtration of the emulsion, fine linen, purified cotton wool, or a special paper which is sold for the purpose at the German photographic stock houses, may be used. The emulsion is now quite ready for use in coating either ordinary glass, opal glass, or paper; but if it is considered desirable to preserve the emulsion in the jelly form any great length of time, it is advisable to add 0·2 parts of thymol or phenol to each 100 parts of emulsion, the preservative agent being previously dissolved in 5 to 10 parts of alcohol.

For the dark room, used for the preparation of the chloride emulsion, it is sufficient to provide the ordinary yellow or orange illumination required in working the wet collodion process.

PHOTOGRAPHIC FURNITURE.

One of the principal Berlin papers, the *Berliner Tageblatt*, has passed some remarks on photographic furniture.

Even in the first and most fashionable studios, it says, we find a heterogeneous company of more or less defective pieces of furniture—curiously turned chairs with the most complicated carvings, and tables of a like description, but differing in important particulars from the *meubles de mode* generally found in our drawing or dining rooms; these, in fact, constitute the furniture specially constructed for photographic purposes, the principal object of which is to produce artistic effect. Photographers are not concerned that the furniture they use in their art should have a practical value, or that it should correspond with anything to be met with in a gentleman's smoking room or a lady's boudoir.

We have before us the photograph of a successful author who had the fancy to be represented as if he had been surprised by the photographer at his daily vocation—that is to say, at his writing table. But what a writing table! It is scarcely large enough to give room for a sheet of paper besides the arms of the occupant, and yet a miserable little inkstand and a worn-out book must also be made to find a place on it. And these are supposed to be the materials of a professional *litterateur!* In another photograph emanating from the same aristocratic studio the same table makes its appearance, but this time doing duty as a piano —a transformation which, on closer inspection, is managed in a very simple and ingenious manner. The lady, a well-known artiste, sitting in front of this instrument, seems to be trying in vain to extract music from its sham key-board. Now, a cottage piano is a piece of furniture to be found in every middle-class dwelling; but have our esteemed readers ever seen one in a studio? Scarcely, we think. Of the photographers in the smaller provincial towns we will say nothing. They have at their command, both quantitatively and qualitatively, a more modest equipment; generally, they place their victims in front of a bare wall, or beside a pillar, something like William Tell in the Opera arranging his boy next to a tree. Occasionally the scaffold is formed of an imitation balustrade. Now in ordinary life how often do we find time or opportunity to lean against a column, or to lounge over a stile?

We have before us a portrait, taken in the studio, of an artist who, though he has a great reputation, does not hesitate to follow his colleagues in making the sun an accomplice in his contemptible devices. A young man in evening dress is depicted sitting on a drawing-room chair that has twisted legs, in the midst of an open landscape, and in the distance the wide sea. Can a perverted imagination go further? And yet this portrait—which, by-the-bye, is an excellent photograph—emanates from one of our most celebrated studios. Any one who takes the trouble to turn over the leaves of the first album he comes across is sure to find similar absurdities. But to enumerate the sins of our photographic artists in this direction would be an endless task—we must give it up.

Now, however, in a period when art manufacture is making efforts to establish itself on a higher level, when we are all trying to induce it to run in the lines of public taste and style, it is greatly to be desired that, in the region of photography, and more especially of portrait photography, there should be an advance in the same direction.

◆

THE ELECTRIC LIGHTING AT YORK.

Notwithstanding the counter attractions of the Electrical Exhibition in Paris, it may be well to put on record the experiences of a visitor to York during the recent meeting of the British Association in that town. Arrived at the railway-station of the North-Eastern Company, which is one of the largest and most magnificent specimens of engineering architecture in the kingdom, we found it brilliantly illuminated by a score or more of Brush lamps, which, burning steadily, diffused a white light amply sufficient to regulate the traffic, and to set off the fine-curved lines of the newly-painted roof in a very satisfactory manner. Coming out of the station the traveller crosses the Ouse Bridge, and enters the town, to find the main thoroughfares illuminated in the same way, and also the new Exhibition Building, where the President's address and evening lectures were given, and most of the larger entertainments.

Here one could examine at leisure the Indian collection of H.R.H. the Prince of Wales, the grand telescope of Messrs. Cook and Sons, and other scientific objects, before turning into the art galleries containing the treasures rescued from Duncombe House at the time of the fire. The walls were covered with fine pictures in water-colour and oils, illuminated in separate rooms according to different systems, some of the paintings being lighted by Swan's "incandescent" lamps arranged as chandeliers in groups, each of seven vacuum globes, gathered up into what might be called "electric sunlights;" six of these latter—or forty-two lamps in all—gave a quality and degree of illumination which excited universal admiration, whilst in an adjoining room the effect of ordinary gaslight was shown for comparison.

The Large Hall was, on the first night, illuminated by the Brush lamp alone, but, with improvised arrangements, these did not seem to answer so well as in the streets outside, so that on the second night recourse was had to ordinary gas lighting; but when, for the concluding soirée, both gas and electric lights were used conjointly, the effect was truly magnificent, and showed to perfection the varied colours of the ladies' dresses. The power was mainly supplied by one of Siemens' large alternating current machines; but upon occasions the Swan lamps were worked with Faure's Accumulators, the apparatus itself being open to inspection in one of the side galleries.

At Mr. Spottiswoode's lecture on Electric Discharge, the flashes from a powerful induction coil between disc and point, the aurora and stratification due to partially exhausted tubes, and peculiarities of the Holtz electrical machine were shown and described, besides two tables of the Lane-Fox construction, which differed but slightly, if at all, from those shown by Mr. J. W. Swan.

And, finally, as we reported last week, the whole subject of electric lighting was discussed in the Mechanical Section, when evidence as to cost and photometric value was furnished by Sir William Thompson and Mr. Bottomley, Dr. C. W. Siemens, Sir F. Bramwell, Mr. Preece, and Mr. J. W. Swan. The special application of the Swan lamps to the lighting of mines and tunnels was also described, and an improved form of safety electric lamp with double glasses and strong protecting wires was shown at one of the evening meetings. If it be true, as stated, that more light can be got from the electric lamp than from the gas used for driving the Otto engine, the practical realisation of electric lighting for photographic and other purposes cannot be long deferred. Sir William Thomson reported the results of his experiments with Swan's Incandescent Lamp, as giving from 150 to 200 candles standard per horse power, with possibility of increase by urging the current up to 300 candles; the condition of greatest economy being that of working at about eighty volts, or the highest point that the lamp will bear without rupture. This form of lamp was, in the opinion of Sir William, that best adapted for household illumination, and generally for domestic purposes. In his experiment he always took the shadow of a single object as being more accurate than the ordinary way of using the photometric apparatus, or, as he humorously called it, "the Jack in the box."

◆

ROYAL CORNWALL POLYTECHNIC SOCIETY.

Judges' Report.

The judges have great pleasure in congratulating the Society upon the success of this department, both as regards the high technical excellence displayed in most of the exhibits, and also in the great increase in the number of exhibits in comparison with the past few years, and again the judges notice the rapid strides the gelatine process has made during the past year, most of the present exhibits having been taken by this process.

Section 1.—*Professional Photography.*

The landscapes in this section are few in number Mr. A. Hendrey takes the only award (2nd bronze medal), for a frame of charming little snow landscapes, No. 796, being beautifully rendered, and superior to anything of the kind they have ever seen, the generality being very hard. Mr. J. Milman Brown contributes six pictures, which are somewhat dull and heavy, the best being Osborne House. Mr. John Bates Blow sends two frames, one containing nine views, mostly of Newlyn, near Penzance, the subjects in themselves being most admirably treated, and would have taken an award, had it not been for the slovenly finish; in several are large dark spots, which might have been touched out in the negatives. Three of the prints show great artistic taste; in the treatment of the fishermen's cottages and surroundings, the groups of figures are well arranged. The other frame is a carbon enlargement of two dogs, which also possesses some good points from a photographic point of view. Mr. W. G. Long sends a frame of ships of the Royal Navy, which are good specimens of the different styles of naval architecture. Reuben Mitchell sends two frames, No. 813, "Elm Trees," being fairly good; a coast scene (814), an instantaneous view of the sea beach, is not very interesting compared with other instantaneous pictures in the exhibition. Mr. J. G. Whaite sends again this year four frames of charming instantaneous studies similar to those exhibited by him last year; and though, owing to his having taken a medal in the same section last year for the same class of picture, he is debarred from taking a medal of the class this year, the judges highly commend his pictures. Mr. C. R. Lenthall, of Reigate, sends four pictures, viz., two interior, which show clean and careful manipulation, the two others being a landscape and a group, which are fairly good.

Chester Cathedral (interior), a grand picture exhibited by Mr. Silvester Parry, is one of the finest photographs of its class ever exhibited, and to it the judges have awarded their first silver medal. The same gentleman has two other pictures, one entitled "Canine Frindship," the other being a church with river scene, which possess some good qualities. No. 721, a frame of botanical studies, by Charles Henry Evans, would have been much improved if they had not been so black and cold in tone. Mr. David Hedges contributes four frames, three being studies of animals in his well-known style. A very interesting collection of six instantaneous pictures are exhibited by Robert Harris (No. 772) taken on board the steamship *Arab* going full speed; to this series the judges have awarded a first bronze medal. The Platinotype Company send a large collection of examples of printing by their process, one great charm being their absolute permanency; the finest specimen is a frame of four bas-reliefs. Mr. W. Harrison exhibits a fine interior of Antwerp Cathedral, which, in the opinion of the judges, would have been improved if it had been printed in silver instead of carbon, as they do not think the print exhibited does full justice to the negative.

In portraiture, Messrs. Byrne, and Co., of Richmond, send some exceedingly fine examples of portraiture on china, which seem to have an elaborate finish; a first bronze medal has been awarded to these. The same firm send also some good examples of cabinet and promenade portraits. Messrs. John Chaffin and Sons have been awarded a second silver medal for their excellent portrait study entitled, "The Signal," being very artistically treated, and the composition being well carried out; they also send several other pictures, notable among them being "Going to School," "Aunt's Birthday," "My Pet," &c. Julius A. Kay sends a portrait (No. 733), in the so-called Rembrandt style, of Mr. Perreni in character, which is well treated. Messrs. E. Day and Sons send six portrait studies of heads (vignettes), which are very soft and delicate. E. Denny and Co. forward six frames of small portrait studies, one a coloured group which is scarcely suitable for a photographic exhibition. Mr. Arthur Debenham is again an exhibitor, and his portrait studies are very fine; "Painting the Plaque," in the opinion of the judges, is the best. The one entitled "Summer" is also very good, representing a young lady with a lawn tennis racket; the pose is easy and graceful. Messrs. W. T. Morgan and Co., of Greenwich, received a first bronze medal for their enlarging process, viz., the Argentic Gelatino-Bromide Process; the results exhibited are very fine indeed, and appear to require but little working up. No. 766, 7, two portrait studies by J. T. Robinson, cabinet size, one entitled "Catchy Catchy," a little laughing child in night-dress, is very amusing; the other is a portrait of a boy. Both of these show great artictic taste on the part of the photographer. The finest, and one of the grandest composition pictures this year is exhibited by Mr. W. Gillard, of Gloucester, entitled "Reading to Granny" (No. 771), a cottage interior. The figure of the old lady is admirable, and in the opinion of the judges it is the most natural photograph of the kind they have ever seen, and therefore they award it a first silver medal. Another picture by the same artist, with some cattle crossing a stream, is very creditable. Mr. Thomas Protheroe sends four frames of portraits, cabinets, &c., with nothing special about them of interest. Mr. F. Argall contributes six frames of portraits, some of which are very good. Mr. F. A. Bridge sends a group of eighteen eminent musicians and composers who performed the Toy Symphony, a photograph stated to have been taken in an ordinary room. In the centre of the group is the Viscountess Folkestone. On the whole, it is a very interesting photograph, and is highly commended.

Section II.—*Amateur.*

Mr. G. Williams sends one frame (No. 851) of instantaneous studies (views on Margate and Ramsgate sands), which, in the opinion of the judges, are the best and most perfect examples of instantaneous photography they have ever seen, and to which they awarded a first silver medal. Mr. J. G. Horsey has been awarded a second bronze medal for four frames of photographs, some of which are perfect little gems. Four frames by Cecil V. Shadbolt, which are well rendered, and technically perfect, have been awarded a first bronze medal. Again this year Mr. J. M. Brownrigg contributes some of his well-known landscape studies. The smaller sizes are considerably best, the four larger ones being somewhat too soft; a little more force and brilliancy would have left nothing to be desired. Mr. Andrew Pringle sends five pictures, and though, in the opinion of the judges, they do not come up to his exhibits of 1879, his present exhibits show great taste. Mr. H. B. Berkeley sends nine small pictures printed in platinotype, which appear somewhat heavy; if printed in silver the results, upon the whole, would have been undoubtedly better. Mr. W. J. A. Grant contributes two frames of views taken in Nova Zembla, which are full of interest. Nos. 883-4, by R. N. Hormazdji, are two little studies, which are somewhat marred by being rather too heavily printed. Mr. S. P. Jackson sends nine small studies—mostly on the River Thames—of boats and water in motion, which are clever and artistic studies.

Section III.—*Photographic Appliances, &c.*

No. 894, by Mr. Otto Mohr, is an improved lantern-stand fitted with double dissolving-tap and valve to prevent the return of the gas. In the opinion of the judges this piece of apparatus has much useless work about it in the shape of screws, &c., the back pressure valves being very defective in construction, and perfectly useless for the purpose they are intended for. No. 895, by the same contributor, is a piece of apparatus called an improved oxygen gas purifier. It is most elaborate, to say the most of it, and the numerous screws, taps, &c., seem to make the simple method of washing the gas very undesirably complicated. No. 896, an instantaneous shutter, a clever contrivance by Messrs. Hunter and Sands, of London, seems very effective for the purpose for which it is intended. No. 897, a camera with swing back, contributed by the same firm, is a useful and portable contrivance, but several other London makers adopt the same form of swing back. No. 898 is a frame of instantaneous pictures taken by the above-named instantaneous shutter (No. 896). No. 899, an instantaneous shutter by Mr. S. P. Jackson, is the most simple and effective of its kind, and less likely to get out of order than many; to this has been awarded a second silver medal.

THE ROYAL CORNWALL POLYTECHNIC SOCIETY.

FROM OUR SPECIAL CORRESPONDENT.

This Society opened its forty-ninth annual exhibition to the general public on Tuesday, Sept 6th, at one o'clock p.m. The President, the Rev. Canon Saltern Rogers, gave the opening address to a very large and appreciative audience, in which he alluded to the various departments of the present exhibition. He remarked strongly on the great success this year of the photographic department under the charge of Mr. William Brooks. He said it was one of the finest exhibitions of photography the Society had ever had, which was very encouraging in every way, and it was arranged that on Thursday evening Mr. Brooks would give an explanation of the various and most modern processes in the photographic art, and he had no doubt, as in previous years, it would be highly interesting. He (the President) then alluded to some of the most notable of the exhibits. To his own mind, the most wonderful picture in the exhibition was one by Mr. William Gillard, of Gloucester, "Reading to Granny;" he could not speak too highly of it. The composition and the high artistic feeling throughout were marvellous. The exhibition was also strong in examples of instantaneous photography, the finest being by Mr. Williams, the subject being "Ramsgate and Margate Sands," in which every individual figure was a perfect little study; little children were depicted running about, and some splashing the water over the others in childish play, and this, he was told, was the outcome of the gelatine process. He also alluded to some exhibits by Mr. Robert Harris in the same department, being views taken from on board the steam ship *Arab* on the way to the Cape; they were also very wonderful, and showed how useful the process was in depicting moving objects. In one of the pictures was one of the yards with the men manning it; the camera had evidently been placed in the rigging of the other mast. He also wished to call attention to the fine example exhibited by Mr. Silvester Parry, the interior of Chester Cathedral, which was a noble piece of work, and a very perfect picture. Another picture, very interesting, and although small, not without interest, was one by Mr. F. A. Bridge, being a group of the most eminent musicians and composers of the present day, who had performed the toy symphony on toy instruments. It was amusing to see such men as Sir Julius Benedict performing on a rattle, and Arthur Sullivan playing a tin whistle, and he had been given to understand that the proceeds of the performance realised the sum of £400, and the profits of the photograph was about £40, which was handed over to the Children's Hospital by Mr. Bridge. He also remarked the beauty of some little studies in the amateur department by Mr. Horsey, a new exhibitor, some being very perfect. He concluded his remarks on the photographic department by saying that as next year would be the jubilee of the Society, he trusted all its exhibitors would send so as to make as great a display as possible, as this was the oldest institution of its kind in the kingdom, and he hoped it had done a great good by way of encouragement to young contributors.

I think myself, on the whole, it was one of the finest photographic displays it has ever been the good fortune of Falmouth to have. It seemed to be the talk of the town. At times it was almost impossible to get into the room, and crowds of people were generally to be found around the productions of Mr. Gillard and Mr. Silvester Parry, which seemed to be highly appreciated. All the pictures appeared to be admirably hung, and everyone hung to advantage, so that one would not clash and destroy the other; but I think that if the Society could see its way clear to have the room lighted at the top instead of the sides as it now is, it would further enhance the charm of the photographs. It is a very good idea to have the photographs in a room by themselves, instead of being in the large hall as they used to be in former years, as the colour of the oil and water colour painting seemed to destroy the beauty of the photographs, and made them look dull and heavy.

On the Thursday evening there was a large attendance to hear Mr. Brooks explain the various processes now in use by which most of the pictures in the exhibition were made; the instantaneous shutters of Messrs. Chadwick, Cadett, Jackson, Hunter and Sands, seemed to greatly interest the audience; the greatest feature was the demonstration of Morgan's gelatine paper process, in which Mr. Brooks exposed and developed a life-size enlargement in the presence of the audience. The image making its appearance on the application of the developer was found to be the portrait of the president, the Rev. Canon Rogers, which was received with great enthusiasm, the applause being hearty and very prolonged. I noticed a large number of photographers present who seemed to take a lively interest in the proceedings.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographing Children—Photographic Season Ticket Holders—Gelatine *v.* Collodion—Universal Thread for Lenses—Photographic Advertisements.

Photographing Children.—The task of photographing children of the tiresome age of from one to four years old is at once a delight and an abomination. If the light is good and everything goes well, you may get a picture of infantile loveliness which will be a thing of joy and beauty, and prove an inexhaustible advertisement of your skill; but if the reverse, and you go on reducing your stock of dry plates with failure after failure, you come to regard the innocent as a monster in disguise, and no amount of expletives let off in the dark-room will restore your equanimity. Now is it not possible to lessen the chances of failure? The focussing of a child is always a fidgetty operation. You place it in position, and bury your head under the cloth; you think you have got everything sharp, and proceed to insert the dark slide. Before, however, this is accomplished, baby moves its head completely out of focus, and you have to go through the operation *de novo*, tiring the little sitter, and fatiguing yourself. The simplest plan would appear to be to have a camera and lens on purpose for children; to register the distance between the chair and the lens, and never alter one or the other, so that the focus would always remain the same, and you would never require to look at the glass screen. This would necessitate some special studio chair or couch on which the infantile sitter could be posed and held so as to be always in the exact spot where the focus would come. The devising of a combination chair and "rest" which would secure the child sufficiently, and yet not compel it to sit stiffly, might be a matter of some difficulty, but is surely not insuperable. The gelatine process is now so rapid that failures from movement ought to be almost impossible. Not so with imperfect focussing, and we believe that in nine cases out of ten this is the cause of disappointment. No doubt the uniform size, and nearly uniform pose, which this method would entail might be an objection in the eyes of an ultra-artistic photographer; but we fancy the majority of the profession would hail any one as a benefactor who could invent a method by which photographing children could be accomplished without the present annoyances.

Photographing Season Ticket Holders.—"They manage these things better in France." It would never occur to any English Railway Company to ordain that each season ticket holder should deposit a photographic portrait of himself in its keeping—a request which has just been made by the Western Railway of France. No doubt the Western Railway Company has its reasons, but to the outside public the demand is a somewhat unintelligible one. Are the officials required to make themselves familiar with the features of the season ticket holders by a careful study of their photographs, and expected to retain the said features in their minds, so as to be able to compare them with the actual faces when the latter present themselves? Would it not be necessary, too, for each season ticket holder to have his photograph taken afresh every year? Whiskers and moustaches have a habit of growing on the adolescent lip and chin, and a twelvemonth works wonders in this respect. Many people, too, are rather changeable in their hirsute appendages, and the photograph of to-day by no means represents the face of the sitter to-morrow. There is, perhaps, a shadow of a reason for having one's photograph inserted inside a season-ticket. In case of losing it, for instance, a ticket collector would be able to detect an impostor, who having found the ticket passed it off as his own. But this supposes the dishonest person to be stupid enough not to have his photograph taken and subsitituted for the rightful owner's, so that, after all, this reason is not worth very much. Then what a trouble to have to sit for one's portrait before a ticket can be issued! It would be almost necessary for the Company to have a photographer on the premises, as some hair-dressers have hat renovators, to take you "while you wait." On the whole, we fancy that with the exactions English companies already impose, the condition of a photograph would be the last straw to break the camel's back. Still, it would be interesting to know with what object the Western Company has made the rule. Can it be that it wishes to do photographers a good turn, and give a spurt to the somewhat waning interest in photographic portraiture?

Gelatine v. Collodion.—The gelatine *v.* collodion controversy has been pretty well thrashed out, but a correspondent in last week's issue raises a question which surely carries with it its own answer. If gelatine plates are placed in the market at a price impossible to make them at a profit, the inference is that they are badly prepared, and will give but trouble and worry to the unfortunate photographer who uses them. In a conversation between dry plate photographers, the first question put is, "Whose plates do you use?" Then, in all probability, follows a lengthened criticism on the various makers of dry plates, in which names are handled with greater freedom than is permissible in these pages. It follows from this that a maker of bad plates soon gets, like his work, "spotted," and hence low prices cannot pay. This is a fact which manufacturers should bear in mind. It is very certain that a photographer would not hesitate which to choose—a cheap plate not to be depended upon, or a dear plate in which the results were nearly always certain.

A Universal Thread for Lenses.—Mr. Cutchey's suggestion at a recent "Thursday Evening for Photographers" (what a name this is; could not a better one be found?), that opticians should adopt a universal thread for the flanges of their lenses, so that a lens of one maker should be interchangeable with that of another, is a good idea, though we have little hope of it ever being put into practice. Yet, up to a certain point, the thing could be done. All that is necessary is a certain standard thread to be agreed upon for lenses of certain sizes—that is, all lenses from two to three inches diameter should have the same thread; three inches to four inches another also similar, and so on. This would not be a very difficult matter, but we fear our opticians are too conservative to alter their plan of working.

Photographic Advertisements.—The advertising mania has touched pretty well everything, from tramway car tickets to the pyramids; but it has not as yet made much use of photography. The photographer's time has yet to come. It is true a few house agents have had "eligible mansions" and "desirable residences" photographed; but, as a rule, the work has been so badly done that the pictures repel rather than attract. One or two tradesmen have also tried having some speciality in their goods photographed, but, somehow, disappointment has generally resulted, and the wood engraver, the lithographer, and the colour printer have not been ousted from their position. It may be that photography is too truthful and wants the power of beautifying. Certain it is that no photographer can hope to please (say) the owner of spacious premises in the same way that an artist can. Perspective and proportion the wielder of the pencil totally ignores, and all he aims at is to make a gigantic building out of what in reality is a very modest establishment. So far as architectural advertising is concerned, then, photography is quite out of court. But there are minor uses to which it could be put, if the photographs could be produced in some tasteful way. The majority of photographs which have been done for advertising purposes are bald, obtrusive, and often positively ugly in their glaring literalness. What is wanted is an attractiveness which will catch the eye. To some extent this has been done by an American firm of cigar merchants, whose advertisements are now to be seen in some of the London tobacconists, and invariably attract the passer-by whenever they are shown. These advertisements consist of cabinet photographs of actresses, surrounded by the words in an ornamental scroll, &c., setting forth the virtues of the cigars in question. The photographs are evidently produced by double printing, and admit of any variety in design. Of course the main point is to get pretty faces, and of these there is no lack in England. The pretty nobodies who are so freely exhibited in the windows of photograph dealers might thus serve a useful purpose, a quality which they can scarcely be said to fulfil at present.

At Home.

HERR HOF-PHOTOGRAPH JOSEF ALBERT IN MUNICH.

They are early people in Munich. There is no need to wait until noon to make a call for fear you may interfere with the commencement of the daily labour. At nine o'clock you will find the busy establishments here in full swing, and, possibly, if you ventured there at eight, nobody would feel put out but yourself. Going to work so early reminds one of the visit of the Emperor of Brazil some two years ago, when his Imperial Majesty always began the serious labours of the day about six. The comic papers, we remember, made very merry over the Emperor being up betimes, and published humorous diaries of what was done in the small hours; but it was not such fun for those who had to rise from a comfortable bed, hours before their wont, to attend upon his Majesty. We ourselves were called upon to explain the various applications of photography to military purposes while the morning air was still raw and chill, and, before seven, had gone through a demonstration of the carbon process to his Majesty's entire satisfaction, if not to our own. Herr Albert, it seems, has done a good deal of work for the Emperor of Brazil, and, we believe, holds an appointment under his Majesty. Thus it comes about that early rising and photography are coupled in our minds as we are here in Munich, paying a visit "At Home."

Mr. Court-Photographer Joseph Albert has his establishment in one of the best streets in Munich, the Karlstrasse. He holds high rank as a portraitist, and, as we pass into the broad entrance, between handsome columns, we see many magnificent examples of his work. The reception room is small, but well appointed, and on the walls are some large direct portraits with six-inch heads, as well as some highly-finished enlargements, all of them of notable persons. The Emperors of Germany, Russia, and Austria, the boy-like King of Bavaria, as well as potentates from Saxony and Hanover, are here represented, from negatives taken by Herr Albert himself. All the prints are, however, in silver, and there is not a single example of carbon printing on the walls. Herr Albert prints either by silver or by Lichtdruck, and, if you like, he will take you a carte portrait and furnish you with five hundred copies of it for thirty marks, or thirty shillings; a thousand copies cost £2 10s.; or, if it is a cabinet portrait, then a thousand copies cost £3 10s. The prints are only upon writing paper if delivered at this price, and thick plate paper or cardboard pictures would, naturally enough, cost more. For glazing, an extra twenty per cent. is charged.

We must not, however, lead our readers to suppose that very high class Lichtdruck portraits are furnished for this amount. As most of us know very well, to give good Lichtdruck impressions, not only must the negative be suitable, but the object as well. A gentleman in a black hat and black coat could not be satisfactorily reproduced by Lichtdruck except under much difficulty, and in ordinary circumstances, people who know what silver prints are, would not be satisfied with impressions in Lichtdruck. In a word, while very much can be done in collotype printing, and, in the case of reproductions of paintings, &c., the most satisfactory prints produced, we have not yet got so far as to print off ordinary portraits by steam; and when Lichtdrucks are particularly well done, we may be sure no pains or time have been spared in their production.

Collotype printing is not merely done by hand-presses now-a-days, but by machinery; and here across the yard we see two so-called *Schnellpressen* (quick presses) at work. A gas-engine of six-horse power is employed to drive the machines, and each machine requires the attention of a skilled mechanic and a girl. The press is very like the lithographic quick-press with which some of our readers are doubtless acquainted. Upon a big steel bed lies the little collotype printing block. It is a piece of glass nearly half an inch thick, its uppermost surface carrying the bichromated gelatine image. The block seems very small for so large a press, for, as the metal bed moves to and fro, and the big cylinder that carries the paper revolves, only a double cabinet print results therefrom. The mountain moves, and a mouse issues forth. It takes, perhaps, a a minute to produce the pair of prints. At this particular machine they are printing copies of *Schützenlisl*, a work just now much in request by the Munich public. The negative is from a huge painting of a Munich beer-girl—a lively young person indigenous to the soil, who trips about among her patrons with half-a-dozen foaming tankards in each hand—and as there is a good deal of gradation and large quantities are required quickly and cheaply, the Schnellpress is employed in preference to the slower and more accurate hand machine.

Let us watch the printing for a moment. The glass printing block, with its brownish film of gelatine, moves horizontally to and fro, and, as it does so, passes under half-a-dozen ink rollers, which not only apply ink, but disperse it. Some of the rollers are of leather, and some of glue, and whenever the printing block retires from underneath them, an inked slab takes the place of the block, and imparts more ink to the rollers. It is the man's duty to see that the ink is duly carried to the rollers, and applied by the latter in sufficient quantity; while to the girl, who stands at some height above the machine, falls the task of placing a sheet of paper around a huge cylinder, which, in revolving, presses against the block, and thus secures an impression on the paper. Sometimes as many as eight different rollers are employed for inking—the surface of the block being touched by all as it passes underneath them—for the difficulty in working by machinery is to apply the ink as delicately and equally as possible.

It is necessary at intervals to damp the block, and when the printer in charge finds this to be the case, he stops his press for a few minutes. The gelatine film from the first has been impregnated with a little glycerine, which serves to retain moisture, and now a little more glycerine and water are applied by means either of a cloth or sponge. Then, previously to resuming work, a leather roller is passed over, o remove surplus moisture, and the block is again ready for rinting.

The quick presses in use at the Albert establishment will produce from 800 to 2,000 copies a day, but, as we said before, the work is obviously not so fine as that produced by a careful printer with a hand-press. At the same time, there is a vast amount of work that naturally falls to the lot of the Schnellpress. The printing of pictures for catalogues offers a wide field. Hatters, ironmongers, engineers, bookbinders, tailors, furniture-dealers, &c., &c., are all beginning to find out the value of photographic illustrations, and Lichtdruck renders great service in permitting them to place before the public representations of objects for sale in a most novel and satisfactory manner.

The actual preparation of the printing blocks we shall detail in our "At Homes" at Herr Obernetter of Munich, and Herr Löwy at Vienna, merely remarking here that Herr Albert, no more than his colleagues, does not practise the old method of Lichtdruck, in which two films of bichromated gelatine are applied. Herr Albert's original plan—and he was the first to employ Lichtdruck practically, if we except Garnier's beautiful process—was to apply a preliminary coating of bichromated gelatine to the thick glass plate, the film being exposed through the back of the glass, and thus rendered insoluble and tightly cemented to the surface; this firm film served as a basis for the second sensitive coating that was afterwards impressed by the negative. This double treatment of the thick glass plate is now definitely abandoned in most Lichtdruck establishments, and, instead, a preliminary coating of soluble silicate and white of egg dissolved in water is employed. This solution must be very dilute, it must be prepared fresh, and last, but not least, the silicate must be entirely free from caustic potash; otherwise the result is never perfect. The preliminary film is exceedingly thin, and, prior to the application of the bichromated gelatine, it is rinsed with water, so that an open porous surface may be obtained. The printing, which is done in an ordinary printing frame, is usually conducted with a stripped negative, but a reversed negative taken on patent plate can be pressed sufficiently in contact to give a sharp impression.

Most Lichtdruck prints are treated with shellac varnish after drying, and in this way are made to look very much like silver prints, for which they are frequently sold. Carefully printed Lichtdrucks on matt plate paper are not varnished, these being generally used for book illustrations.

We pass from the Schnellpress room into the ordinary silver printing room, where a revolving table for vignettes at once attracts notice. It is a round table about four feet in diameter, upon which the printing frames are laid. The motive power is a large clock, or rather the works of one, the clock being set in motion by two heavy weights, such as one sees attached to the ordinary Dutch clock. "It is a very simple affair," says our friend; "I constructed it myself. The table moves very slowly, but goes on all day, if you pull up the weights occasionally." We saw the vignettes thus automatically printed, and they were very finely graduated.

In Herr Albert's establishment, the cabinet portrait style is most favoured by the public, the charge made for a dozen pictures being 27 marks or shillings; but then Munich, it must be remembered, is altogether a cheap city.

Some specimens of colour printing in Herr Albert's studio deserve mention. Herr Albert has been experimenting with some success on the method which is usually connected with the name of Ducos du Hauron. A painting is photographed three times; the first negative is taken through a red screen, the second through a blue screen, and the third through a yellow screen. Albert employs coloured liquids for his screens, and in this way he secures three negatives, in the taking of which respectively the rays of the three primary colours have been absorbed. The negative taken through the red screen is then printed upon red carbon tissue, and the other two negatives printed respectively with blue and yellow tissue. Then the three prints in red, yellow, and blue are superposed, and the picture is finished. By working in this way, Herr Albert claims to have reproduced a coloured picture of Lemercier, which had been produced from eighteen stones (and therefore contained eighteen different tints) in all its pristine beauty. As the original was not at hand for comparison, it was impossible to say how far success had been secured, but certainly the Albert pictures are very pleasing and interesting. To talk of the process as one of photographing in natural colours is of course nonsense, for there is no relation between the colours absorbed by the screens and the particular pigment which happens to be in the carbon tissue; but, as an important experiment, the matter deserves notice. But more satisfactory still than the compound pictures in colours, was a compound picture we saw (from the three negatives) printed in monochrome or sepia; the painting was here reproduced far more satisfactorily than when a single negative only was employed for printing. In effect, the colours of the original picture appeared to have been more truthfully translated into monotone by taking three negatives under the particular conditions; so harmonious, indeed, was the result, that we should not be surprised if in future, in the photographing of paintings, recourse is not had to this particular method, or a modification of it.

The "By-the-Bye" next week will be "A Photographic Museum"; the following "At Home" will be "Fritz Luckardt in Vienna."

Notes.

This day fortnight is the last moment for sending in pictures to the Pall Mall Exhibition.

Herr Schaarwächter and Herr Prümm, two of the leading Berlin portraitists, have purchased Mr. Woodbury's new patent.

Mr. Robinson and Captain Abney's new work on Silver Printing will be published simultaneously in this country and America.

Messrs. Downey, of Ebury Street, make use of a movable canopy under which to work their cameras. It measures about 7 by 5 feet, is six feet high, and runs on castors, the sides draped with tapestry which may be made to fall on all sides, although, of course, this is never required. There are racks around for placing a dozen or more dark slides, so that these are always to hand immediately after focussing. The tapestry obviates the need of any dark-cloth, and under the circumstances the assistant can work very quickly.

A clever accessory in the studio at Ebury Street is a trapèze, which Messrs. Downey have employed in some charming studies; for, strange to say, it is with ladies that the accessory is mostly used. With one hand, or even both hands, holding the trapèze, a delightful pose may be ecured, if the model happens to be young, and bright, and *spirituelle*.

In the Malay Peninsula, the boundary cairns are photographed, so that pictorial records of the frontier may be kept. It might be well to follow the same plan in the Transvaal, to avoid future disputes with the Boers.

The washing of silver prints is attracting considerable attention in Germany just now. It is the custom in many high-class establishments for assistants to wash each print separately in seven or eight changes of water before it is put into its nightly bath. In the morning the print is again rinsed separately in several waters before being finally dried.

The first evening discourse at the Royal Institution will be delivered by Dr. Huggins, on comets, when that gentleman's recent photo-spectroscopic researches will be described and illustrated by lantern transparencies. Dr. Huggins' wonderful photographs of heavenly bodies cannot fail to be appreciated.

The present generation only knew the Polytechnic, which came to an end on Saturday last, as an institution of light and varied entertainment. But it was classic ground to the photographer, for within its walls Daguerre first demonstrated his beautiful process before the public. In the theatre of the institution in its palmy days, Faraday also lectured on philosophy, and Wheatstone expounded his theory of the laws of sound.

The additions made to the English edition of Dr. Eder's emulsion book are, it seems, to be translated and appear in the next German edition of the work. It is strange that while in this country pyrogallic development is apparently most in favour, with our German cousins ferrous oxalate is more highly spoken of.

Gloomy red dark rooms belong to the past. You can develop gelatine plates with as much light, apparently, as wet collodion films. We saw a skilful photographer the other day rapidly improvise a dark room in a country house which had a window thirty inches by twelve. Two sheets of orange paper with ruby tissue between were stretched over the casement, and the thing was done. He developed a score or more of big gelatine plates in most perfect fashion, simply taking the precaution to put a cover over the developing dish occasionally.

He has a theory, by-the-way, this friend of ours, that deserves to be recorded, no matter what scientists may think, since he is one of the happiest and smartest of dry-plate developers. It is his idea that if you have a very flood of red light in the dark room, any faint gleam of daylight entering through crack or cranny will be absorbed or neutralized in its effects by the roseate glamour that prevails.

It is not all gold that glitters, neither are dazzling West End establishments in aristocratic thoroughfares always in luck. Twenty negatives were taken the other day of a lady of quality, in imperial, cabinet, and carte style; the plates were finely retouched, and a series of mounted proofs sent out. Result: the sale of a single cabinet picture.

We are reminded that there is such a thing as photography on a Sunday in this country. A correspondent says: "A friend of mine, who practised with the camera on Sunday mornings, used to be systematically fined every week for so doing; in fact, it was a question who would get tired first—the magistrate who had to hear the case, or the photographer who had to pay the fine. As the photographer had a thriving business to support him, while the magistrate had only the monotony of hearing the summons, of course, in the end, the photographer triumphed—he offered to pay a month's fine in advance—and now he goes his way unmolested."

"A Photographic Fright" is the title of a merry farce by Mr. Soden, which is played at the Princess' immediately before Mr. George Sims' new play. The plot of the farce turns upon a photograph of a lady and gentleman taken promiscuously on the sands at Margate. We had the statement of an eminent judge not long ago that if a young man and young woman are photographed together, it is *prima facie* evidence that they are engaged. No wonder, then, that the husband in Mr. Soden's farce is led to all sorts of excesses when he has positive proof—an old photographic joke, and consequently a very taking one—that his wife has been keeping company with a stranger.

Dr. Van Monckhoven's method of preparing sensitized paper which will keep, is to add to the silver bath as much nitrate of magnesia as it contains nitrate of silver. Thus he makes up a bath of—

Water	100 cub. cents.
Silver nitrate	12 grammes
Magnesia nitrate	12 ,,

and after every whole sheet sensitized, he adds a further 2 grammes of silver, but no more magnesia.

Here is a story for what it is worth. A photographer advertises cartes at six shillings a dozen, and when you enter his studio, you find the two ends of the glass room are differently fitted. At one end is a shabby background, upon which the rain has left very visible traces, making a sad landscape still sadder by its tears. At the other end is a gorgeous throne-like chair, with gilded arms and magnificently wrought legs. It is only at the end where the shabby background is that portraits at six shillings a dozen are taken.

◆

THE CONCOURS PHOTOGRAPHIQUE AT GHENT.

BY F. F. S.

The town of Ghent has been for the last fortnight in a state of great excitement, in consequence of the series of fêtes which have been organized to celebrate the fiftieth anniversary of the accession of Leopold I. to the throne of Belgium. Military reviews, balls, concerts, theatrical representations, illuminations, banquets, &c., have formed, of course (as in all Continental rejoicings of a like nature), a portion of the programme. But to signalise more especially this interesting commemoration, a grand international *cancours* of the choral societies of the Continent has been instituted, and prizes of considerable value, including a golden medal and a prize of 2,000 francs (given by the king), and a statue of Sappho, by Pradier (the gift of the Count of Flanders), have so stimulated the efforts of the competitors, that it is reckoned more than 2,400 vocalists and musicians have been induced to visit Ghent, besides an enormous concourse of strangers.

To add to the general attractions, the king of the Belgians, with his youngest daughter, the Princess Clementine, honoured the fête with their presence, and opened a new dock which has been recently constructed, with every imposing ceremony usual on such occasions. Among the other industrial arts included in the *concours*, photography played its part, and the provincial syndicate early in the year issued invitations to foreign artists to compete with the Belgian photographers in furnishing photographic views of the city of Ghent, offering prizes ranging from 1,200 to 400 francs, and medals and certificates of honour by way of encouragement. I have just returned from an examination of the exhibition of these views, and think it may, perhaps, interest your readers to have some account of them. They were displayed on the central screen devoted to the *concours* of industrial arts in the Palace of the University.

The jury for the decision of merit consisted of Messrs. Wagener, as president; Vermandel and Hermans, vice-presidents; d'Hauw, secretary; and Messrs. Canneel, de Blockhouse, of Brussels, de Vylder, Donny, and Launonraux, of Liege. The names of the competitors do not appear upon their several exhibits—so that it is impossible to ascertain whether any other than Belgian photographers have taken part in the competition—but that a very considerable amount of interest has been taken in the contest is evidenced by the multitude of the prints, and the very excellent results displayed upon the screens.

Ghent—with its grand old gothic Town Hall—its fine Cathedral and churches, its picturesque quays, its quaint squares and buildings, its winding branches of the Scheldt and Lys, with their numerous bridges and vistas, offers abundant scope for work with the camera, and I was not at all surprised at seeing admirable artistic effects, as in not witnessing enlargements or direct views on a grander scale, of some of the most salient points in this interesting old town. Undoubtedly, prints comparable in point of size with those with which we are familiar in Vienna, Rome, Switzerland, Paris, and Dresden, would be fully justified by the picturesque character of the locality, if artists would but apply themselves to the task of preparing them. The jury were apparently not altogether satisfied with the results of the competition, inasmuch as they failed to assign the first prize offered, consisting of a certificate, a medal in silver gilt, and a premium of 1,200 francs. The second prize, embracing a certificate, a silver medal, and a premium of 600 francs, was assigned to Messrs. Edmund Sacré, of Ghent, and Hofman, of Dresden. The third prize, a certificate and a bronze medal, also fell to Mr. Edmond Sacré. A note appended to the report of the jury announces that they propose adding a premium of 400 francs, and decreeing a certificate and a bronze medal, to the competitor who adopted as his device, "Tout nom vient du soleil."

Whether this distinction may fall to one of our fellow-countrymen or not, I cannot say; but I may mention, *en passant*, that, on my way to Ghent, I met with an English camera at work in the Cathedral of Antwerp, and possibly its adventurous possessor may have extended his journey, and taken part in the *concours* at Ghent. If he should have adopted a foreign device, he may claim the distinction offered, should these lines come to his notice. Messrs. Sacré and Hofman secured the second prize by an admirable selection of a dozen views in Ghent, including the Hotel de Ville, the churches of St. James and St. Nicholas, the ruins of old St. Bavon, the Normal School, the railway-station, the corn-market, and a large cotton factory. The first, fourth, fifth, and last of these were excellent, so far as skill in manipulation is concerned; but surely much finer artistic effects might have been secured had some of the older monuments of Ghent been pourtrayed, rather than these—for the most part—triumphs of modern architectural skill. Artistically, M. Sacré seemed to me to have succeeded better in his competition for the second prize (a view of shipping in the docks), being, in point of perspective, admirable, and, in matter of tone and atmospheric effect, deserving of the highest commendation. This exhibit alone—to my mind *the gem of the exhibition*—fully entitled him to the honourable mention he has received. His Quai des Moines, with a distant view of St. Pierre, was also excellent in its way, as were also his College des Bateliers, and a bird's-eye view of Ghent, apparently taken from the tower of the belfry.

The successful competitor for the third prize secured his triumph by views of the Palais de Justice, the College de Bateliers, the ruins of St Bavon, the Place d'Armes, and other equally striking scenes. Many of the unsuccessful productions exhibiting considerable merit had been signalized by the affix "*Progres*," and altogether it may be expected that the photographic *concours* at Ghent, if it has not elicited any very marked advance in what has been seen hitherto in the way of sun pictures, has at least stimulated the native artists to put on permanent record some of the most striking features of their grand and interesting old town.

◆

THE USES OF GLASS IN PHOTOGRAPHY.

BY THOMAS GAFFIELD.[*]

The Action of Sunlight on Glass.—A few words on this point, and I shall close my essay. You all know and witness every day the action of sunlight in affecting your sensitive films of iodide, bromide, or chloride of silver, and other sensitive compounds. Are you not lost in wonder at the marvellous and interesting chemical changes which the light produces in gaseous and liquid matter? and may I not add still more to your wonder in showing you how gentle and ethereal an element can cause a similar change and consequent movement even among the atoms of so solid a matter as glass? For eighteen years I have watched the workings of the magic pencil of the sun in producing the following changes of colour in colourless glass:

---

[*] Continued from page 430.

1. From white to yellowish.
2. From greenish to yellowish-green.
3. From brownish-yellow and greenish tints to various tints of purple.
4. From greenish-white to bluish.
5. From bluish and other tints to darker tints of the same colours.

By colourless glass is intended glass like that which we see in our windows, which shows little or no colour in looking through its surface; but, observed through the edges, exhibits a great variety of tints, running from the almost colourless white to those of yellow, blue, and green. The really coloured glasses, made so intentionally by the addition of some metallic oxide, or other colouring constituent, can only be observed through the surface, as their opacity, except in the lightest coloured specimens, will not allow an observation through the edges for more than a fraction of an inch.

In coloured glasses, the main colours, except violet, which is rendered a little darker by exposure, are not at all affected; but among the intermediate colours the following changes are notable:

1. From brownish tints to a flesh colour.
2. From flesh colour to tints of purple or violet.
3. From amber, olive, and purple to darker tints of the same colours.

Every change of colour or tint involves the wonderful condition, invisible to human eyes, of a molecular or inter-molecular movement of the atoms of this solid body, and is probably attended by an interchange or re-distribution of the oxygen among the constituents of the glass, and the development, in consequence of this distribution, of the special colouring power of the metallic oxide which has the greatest affinity for oxygen, or stands in the greatest proportion to the other constituents.

And so in some specimens the yellow of the iron predominates, in some the purple of the manganese, and in others the yellow first appears, and afterwards the yellowish purple and purple fully developed.

It is interesting to witness how these results may be applied to the production of printed inscriptions and the impression of ferns and leaves upon coloured and colourless glasses. It is a species of photographic work on sensitive glass instead of sensitive paper, the sun showing itself an excellent printer and developer, and, indeed, the only true photographer in colours.

I ought to say that this defect of a great change of the colours of glass by sunlight exposure does not exist so generally as in former years. It was caused by the use of an excess of manganese to correct the greenish colour occasioned by the presence of oxide of iron as an impurity in the constituents of the glass. When the glass makers found the defect a matter of scientific observation and experiment, and their results published at home and abroad, they remedied the difficulty in a measure by using purer materials, or reducing the proportion of manganese in their "batch," or giving up its use entirely, preferring to have the glass assume its natural and more permanent colour, even if it be a little greenish or bluish, rather than by "doctoring" the mixture—to adopt the glass-makers' term for the use of manganese—to have it light-coloured to-day and easily affected by the sunlight of to-morrow.

This improvement is of especial importance to photographers, who, in all operations requiring short exposures and all the light possible to obtain, would avoid the use of any glass in their skylights which, after a few months or years of exposure, will be robbed of a great proportion of its power to transmit the chemical influence of sunlight by a change to a yellow or purple tint, which in time might cut off almost as much actinic effect as if it had been ground or enamelled on one of its surfaces.

I have made some photographic experiments to show this deteriorating effect, by exposing sensitive paper under glasses of the original colours, and those of the same kind changed by sunlight exposure, and witnessing the perceptibly different shades of darkening produced.

This action of sunlight must not be confounded with that called "rust" or "stain," which is occasioned in some glasses having an excess of alkali in their composition by exposure to the atmosphere, and manifests itself in two ways: first, by a disintegration and roughening of the surface, sometimes producing all the effects of ground glass; and secondly, by an efflorescence and apparent formation of an infinitesimal coating of oxide upon the surface, on which the play of the sun's rays produces all the colours of the rainbow, as with the action of light on the infinitesimal grooves of mother-of-pearl. This is simply surface action, whereas the action of sunlight permeates the whole body of the glass wherever the rays directly strike it.

It may be interesting for you to know that all the curious and ridiculous stories about lightning pictures and portraits on window panes are only the offspring of the imagination of people who have discovered for the first time rusty glasses in their windows. The colours are made by the rust, and the portraits are furnished by the lively imagination of the observers, who are ignorant of this defect in some of the glass of former years.

I have thus endeavoured to speak briefly upon all the points in which my subject touches your special work, and I shall be exceedingly gratified if my humble essay has given any new facts, or suggested any new ideas which may aid you in the progress and successful prosecution of your interesting art.

◆

Correspondence.

CLEANING GLASS PLATES.

Dear Sir,—Poor Artemus Ward tells a comical story of a certain prisoner who was confined in "the deepest dungeon of the castle moat." The walls were several feet thick, so was the roof, and so was the stone floor. The unfortunate man tried in vain to penetrate all three. Then he attempted to force the massive bars which guarded his window. All to no purpose. At last he was struck by a "lucky thort"—"he opened the door and walked out."

Now this little parable may well be applied to many instances of endeavours to do by roundabout methods things which could so much more easily be accomplished by simple means. The photographic art is by no means free from this imputation. For instance, how many recipes have been published for cleaning glass plates preparatory to coating them with emulsion! Caustic soda, spirit, tripoli, pumice, water-glass, and hosts of other remedies have been recommended.

My plan of opening the door, and walking out, is to use simple soap and flannel, to rinse thoroughly under the tap, and to place the glasses in a rack to dry. My plates never frill, and the gelatine sticks to the glass like a creditor.

Those who have been floundering in the billows of conflicting formulæ would do well to try the effect of soap. They can then easily wash themselves ashore.—Yours, &c.,

T. C. Hepworth.

PLATINOTYPE PRINTS AND HOLMES' OZONE BLEACH.

Sir,—On reading in your columns the account of the alleged action of Holmes' Ozone Bleach upon platinotype prints, we at once proceeded to make a trial; though, after many experiments with other substances which have no effect, we did so rather with the expectation of obtaining negative results than confirmation of the correctness of Mr. Henderson's observation.

A print which had been slightly affected by damp—or, in other words, having impure high lights—was cut into halves; one half was put into a wide-mouthed and closed bottle containing the ozone bleach of the full strength, and there the print remained twenty-four hours, or ten hours longer than in the case of Mr. Henderson's experiment. The print was then taken out, the paper being in a very rotten state; the image at this stage did certainly appear to be slightly reduced. The print was not washed, but was allowed to dry gradually during many hours. At the end of this time the surface was covered by the dry hypochlorite, which was massed together in minute heaps. Those parts of the print which had been fully immersed presented high-lights of a perfectly pure appearance; while that part which had been in the neck of the bottle, and upon which the liquid had been drawn by capillary attraction, was of a much deeper yellow tint than before the treatment. The platinum image was not in the least affected: only the dirty "whites" were cleaned.

The print had appeared to be reduced when wet, owing to the pulpy and transparent state of the paper. Moreover, when the impurity on the high-lights had been removed, the image appeared slightly under-printed, owing to the absence of the colouring matter, which had, to some extent, done duty for reduced platinum. It had not been advisable to print the copy more deeply because, in case it had been so printed, the addition of reduced platinum in the delicate tones to this yellowish-brown colouring matter—this discolouration being inevitably present in prints affected by damp—would have caused the prints to appear dingy and over-printed.

We therefore assume that the print experimented on by Mr. Henderson had either impure high-lights, or was treated somewhat roughly, perhaps in washing, so that some of the surface was removed (of which more anon); or, otherwise, that the conclusion of reduction was formed while the print was in the wet or damp state.

In reasoning upon the probabilities of the action of any substance upon a print by any "permanent" process, it is necessary to bear in mind that while chemicals are employed which have no action upon the metal or substance forming the colouring matter, yet these may have a most baneful influence upon the *vehicle* of that colouring matter. Thus, strong nitric acid and sulphuric acid utterly destroy paper, and we know that the ozone bleach dissolves the "insoluble" gelatine films, so that probably even a carbon film could not long be treated with the solution without being destroyed. In the case of platinotype, too, the image, to some extent, is embedded in a "size"; without doubt, this would be removed by lengthy treatment with the "bleach," and consequently a loosening of the fibres of the paper might result. To take a more familiar instance, the action of the before-mentioned nitric acid, none will now say that this has an action on the platinum forming the images, yet it may well have an action upon the *image* by removing some of its basis—the surface of the paper, or other support.

As has been pointed out before, a print on paper can only be as "permanent" and resistant as the paper itself. It would be manifestly absurd to expect an engraving to withstand the effects of nitric acid; yet who will say, because this is so, that engravings are not "permanent"? Permanency is only comparative; and when people buy or make pictures on paper, whether the result of painting or of printing, they are satisfied to find the pictures equal the paper in durability; and often they are satisfied with something less than that when fugitive colours are in question: but that by the way.

It is enough for practical purposes if a print will withstand the prolonged action of noxious gases, and if it be found to remain as unaltered in the white parts as a plain piece of pure paper subjected to the same treatment.

Now, with regard to the possible action of ozone bleach upon the metallic platinum forming the image in a good print. We read that Mr. Debenham was not surprised at any action the bleach might have upon a platinum print, seeing that is well known that it—or rather the calcic salt—would have a dissolving action upon fine gold. Gold has been looked upon commonly as a trustworthy substance for forming a photographic impression, and no doubt many suppose that if the silver image could be entirely replaced by gold, permanence would be arrived at. But this is hardly likely to be the case. Gold in fine division and in the "purple" state often soon undergoes a change in the ordinary atmosphere. This fact has been observed by Mr. Willis; and doubtless among scientific men it is well-known. Platinum and gold are not analogous metals.

Some time ago a statement was published to the effect that bright platinum will tarnish in an ordinary atmosphere. We should much like to see an example of this, and proof that this "tarnish" is a compound of platinum, and not merely a film of "London grime."

We have had a piece of foil hanging from a shelf in a room which is often filled with various kinds of stifling fumes, and it has hung there during more than a year, yet there is no tarnish; but there *is* some loose dust in a moist state upon it. A print, too, has been nailed on the wall just above the foil for fully a year and a-half, yet the delicate tones (it is a vignette) remain unaffected; but the paper itself is rotten and in a very dirty state.

We are glad that the suggestion has been made of a supposed action of Holmes' ozone bleach upon platinotype prints, even though these oft-repeated alarms of fading—produced either by doses of salt and water, or by the action of nitric acid, or by the action of oxygen, or of some "subtle influence" accompanying it; and now, by the energetic efforts of the concoction of our good friend Holmes—are calculated to *damp* the reputation of the process, and to instil into the minds of those who are not well informed in photographic literature and its chemistry a distrust of which it may take a long time to rid them. We are glad, because we have now the means of removing the discolouration from the high lights of paper which has been affected by damp. The solution, however, we look upon as a *cure* only, and it does not supersede *prevention.* Paper in good order will always be best, not only because an additional operation would otherwise be required, but also because the effect of damp is able to damage the shadows as well as the high-lights, though in mild cases the shadows will be found perfectly good while the high-lights are degraded. In such cases as the latter, the ozone bleach will be found to be of value. At the same time, we throw out this hint rather as a "back-stairs" way to success: the careful and experienced worker will seldom make use of it.

We have employed the solution diluted with an equal part of water, and have allowed the prints to remain in it half an hour. A thorough washing is required: the smell of the solution will be retained for a long time. In the absence of proper washing (perhaps an anti-chlor might be advisable) there is a chance of damage to the paper. The paper after the treatment is more absorbent of moisture and mountant.

Those who have platinotype prints with impure high-lights may try the effect of the solution, if only as an interesting experiment.—We are, sir, yours faithfully,

The Platinotype Company.

Proceedings of Societies.

Thursday Evenings for Photographers.

At the meeting held on the 8th inst., Mr. J. A. Harrison in the chair,

A paper on "Frilling" by Ragy (see our last) was read, and a discussion ensued.

Mr. Debenham said he found the method recommended by Mr. Mawdsley, of immersing the plate in chrom-alum previous to development, answer very well.

Mr. Cutchey said he had a sample of commercial plates which frilled very badly—in fact, the film came right away from the glass. Soaking in alum previous to development was useless. He then tried a saturated solution of Epsom salts with perfect success.

Mr. Brown thought that frilling was often due to the use of glass not chemically clean.

Mr. **Cutchey** said he had frequently been annoyed by finding holes in the films of negatives left in his studio to dry, and that on the previous Saturday evening, having occasion to go into the studio, he found an earwig eating the films of an undried negative, and thus producing the marks that had so often puzzled and annoyed him.

Mr. **Brown** said he had found that beetles attacked the gelatine film in the same manner.

In a discussion on intensifiers,

Mr. **Debenham** recommended the formula published by Mr. Webster.

Mr. **Cutchey** said that upon a recent tour in Dovonshire, the facility for washing his plates being very limited, he used peroxide of hydrogen as an hypo eliminator, and found he could intensify negatives thus treated with iron and silver (Wratten's formula) most successfully and without stains. He also found that by using Swan's formula (bichloride of mercury) he could obtain any density required, but was not in a position at present to express any opinion as to its stability.

The reduction of density in negatives was then discussed.

Mr. **Debenham** recommended using ozone bleach.

Mr. **Cutchey** recommended painting the dense parts of the negative with a weak solution of cyanide of potassium.

Mr. **Reiman** said that one firm of gelatine plate makers recommend exposing the plate to sunlight, previous to washing off the hyposulphite, for reducing the density.

The question of the best varnish for gelatine negatives was then brought forward and discussed.

Mr. **Payne Jenninos** said he used collodion, and could take from 400 to 500 prints from one negative; but he found in winter that the silver would penetrate and stain the negative through collodion and varnish.

Mr. **Debenham** found that a varnish which answered for collodion negatives would answer equally well for gelatine negatives.

The **Chairman** said he used French polish diluted with spirit.

Bristol and West of England Amateur Photographic Association.

The August out-door meeting took place on the 19th to Farleigh Castle, near Freshford-on-the-Avon.

The morning opened with thick rain, and, at the appointed time, one only member put in an appearance; and the Hon. Secretary, thinking that it would not rain all day, and this opinion being concurred in by the one faithful member, a hasty drive round to the houses of those who were to meet in that district was taken; and, as it was thought unadvisable to again postpone the meeting, Temple Mead station was reached, and a start made.

On the train arriving at Freshford traps were unlimbered, and the walk up the pretty valley to Farleigh commenced. At this point, fortunately, the rain ceased, and "Old Sol" made his first appearance for the day. It was, however, found utterly impossible to expose any plates, the wind blowing almost a gale; the party, therefore, pushed on to Farleigh Castle. At the inn all did full justice to a substantial lunch, and afterwards got ready for "interior" work of a more ancient kind.

Farleigh Castle was the stronghold of the Hungerfords some centuries since; and, although now a ruin, the chapel in it is in a very fine state of preservation. The little (once sacred) edifice is, perhaps, 50 feet long and 20 feet broad, and it would probably be difficult to find in a place of similar size a greater quantity of grand old armour.

Cameras were at once placed in position, and exposures commenced.

The party then withdrew from the building, and, proceeding to the vault, inspected the five large leaden coffins and two small ones, all in a fine state of preservation, and containing remains of long passed away ancestors and infants, preserved in spirit and other liquid. To give an idea of the great darkness of the chapel, it may be said that with plates ten times more rapid than wet plates, exposures of from thirty to forty minutes were given (since proved to be correct by development). after which all were much interested in examining the fine old oak chests, altar, chairs, and pulpit, the many different kinds of plate and chain armour. An original fully-signed letter from Oliver Cromwell, dated 1652, and in fine condition, claimed attention. Some of the members next exposed some plates on the tomb and marble figures of Lord and Lady Hungerford, of about the same date, also on an earlier tomb of Lord Hungerford, 1369, first Speaker of the House of Commons. Other objects of great interest, such as the old oak pulpit, Oliver Cromwell's letter, &c., were photographed, after which the party sat down to a meat tea.

The return walk to Freshford being accomplished, all arrived in town, if not satisfied, much pleased with the day's excursion.

Sheffield Photographic Society.

The ordinary monthly meeting was held in the Freemasons' Hall on September 6th, Dr. **Morton** (President) in the chair. There was a good attendance.

After transaction of the ordinary business, the desirability of holding an exhibition of pictures, &c., was discussed, and it was ultimately decided to hold one in January next, to take the form of a *conversazione*, at which photographic prints, transparencies, apparatus, and other things appertaining to photography, either of pictures or anything interesting in connection with the art, should be solicited. The arrangements were left over for dissussion at the October meeting.

Mr. **Stringfellow** exhibited one of Smith's new patent cameras (through the kindness of Mr. Turner, Chesterfield), which attracted much attention on account of its portability and lightness, as also the novelty in the arrangement of the swing back. He also exhibited one of Watson's new exposure shutters, lent by E. A. Law, Esq.

The **Secretary** exhibited a pneumatic shutter for the studio camera, of a new construction, which elicited much approbation.

The annual meeting will be held in the Freemasons' Hall on Tuesday, October 11th, when the election of officers will take place, and the members will take tea together.

Photographers' Benevolent Association.

The Board of Management held its monthly meeting at 181, Aldersgate Street, on the 7th inst. The minutes of the previous meeting having been read and confirmed,

Messrs. F. Everard, R. Farr, F. Hambly, and F. Parsons were elected members of the Association. Mr. F. H. Berry was elected as a member of the Board of Management.

Other business having received attention, the meeting adjourned until October 5th.

Talk in the Studio.

The Premier at Hawarden.—We hear that Mr. Fall, of Baker Street, attended at Hawarden Castle on Wednesday to photograph the Premier and his family.

Photographic Club.—Mr. York has arranged to give a lantern exhibition of "life studies" to the members of the Club, and the time fixed is the evening of Wednesday, the 21st inst. The exhibition will take place in the Club room at Ashley's Hotel, the transparencies serving to illustrate the following stories: "The Old Curiosity Shop," "A Trap to Catch a Sunbeam," "Friendless Bob," "Meg and her Brother Bill," and the "Gin Fiend."

Photographs of the Mauritius.—Mr. de Joux, a gentleman who has been engaged for some time past in surveying the island of Mauritius, has forwarded us a fine collection of views, taken on 10 by 8 plates, representing street life, the public buildings, the port, &c. They afford a most interesting insight into the everyday life of Mauritius, and we are glad to hear that M. de Joux intends to publish them through Messrs. Marion and Co., of Soho Square.

The Balloon Society.—Unfavourable weather rather marred the festivities of last Saturday, a steady drizzle of rain serving not only to keep the spectators away, but also to make the balloon unduly heavy; while the atmosphere was so charged with haze as to seriously interfere with the operations of the five or six adventurous individuals who brought cameras and exposed plates. The balloon, Mr. Wright's *Eclipse*, ascended about 3·30, bearing with it four passengers, among whom was Mr. Cobb, this gentleman being provided with a stereoscopic camera and some extra sensitive dry plates of his own manufacture. After the ascent, the company were entertained with roller skating, Punch and Judy, music, a lecture on the application of electricity to ballooning, and other matters. The balloon descended at Wimbledon, and we are informed that the photographic work was unsatisfactory, although more successful than might have been supposed, considering the state of the atmosphere.

Royal Cornwall Polytechnic Society.—There was again a good attendance yesterday at the exhibition of the above Society in the Polytechnic Hall, Falmouth, and it promises to be, pecuniarily, one of the most successful for some years. There was a large attendance in the hall in the evening, when Mr. Brooks, of Reigate, delivered a highly entertaining lecture on the subject of photography, with especial reference to the gelatine process. He then described the process invented by himself—collodion emulsion on paper—which can be employed by tourists for taking negatives, thereby avoiding the inconvenience of carrying about a number of glass plates. A hundred or two of these prepared papers can be easily carried in the pocket; this invention is also used for printing positive proofs. The exposure by contact to ordinary daylight is instantaneous, and the image is developed by ferrous oxalate fixed in hyposulphite of soda, and after thorough washing it is toned with a solution of bichloride of platinum, which gives the appearance of the ordinary platinotype process. Mr. Brooks next described several photographic appliances, notably the instantaneous shutters, one by Chadwick, of Manchester, another by Cadett, a third by Hunter and Sands, of London, and another by S. P. Jackson, the eminent water-colour painter, which has this year been awarded the second silver medal of the Society. He also showed Mr. Warnerke's sensitometer for testing the comparative sensitiveness of photographic plates, as well as the actinometer for testing daylight. In both these instruments Balmain's luminous paint is brought into use as a standard light. Mr. Brooks concluded his lecture by introducing Morgan's gelatine emulsion process on paper for enlargements. He exposed a sheet of paper from a carte-de-visite size negative, and developed a life-size portrait in the presence of the audience. This experiment, and the lecture generally, was loudly applauded, and at its close Mr. Brooks was cordially thanked.—*Western Morning News*. Sept. 9.

Mr. G. Smith's New Portable Camera.—The general use of gelatine-bromide dry plates has largely extended the ranks of amateur photographers, and has exercised a corresponding influence on the apparatus offered by manufacturers; and in the case of portable cameras for out-door work, we may expect a keen competition as regards price, lightness, rigidity, and convenience in use. Mr. Smith's new pocket camera presents some points of novelty and excellence. The base-board is quite detached, and when in use, the front and back frames are each attached to it by a separate thumbscrew. Fittings to suit these are let into the side and end of the frames, so that the camera can be set up either vertically or horizontally. The fitting to the back frame is a modification of a ball-and-socket, or universal joint, which allows of the back being fixed at any angle to the axis of the lens, and so forms a compound swing-back. The fronts slide in grooves in the ordinary way, but the usual screws and plates for fixing them are dispensed with, as by a simple arrangement of springs they stop firmly in position wherever placed. The base-board is fitted with a series of holes through which the thumbscrews fixing the camera pass, the focus being first approximately obtained by the distance between the screws. The focussing screw completes the adjustment of focus. The base-board is also made to do duty as the stand-head, the legs of the stand being fitted directly to pins fitted in it. This is necessary, because the whole of the central axis of the base-board may be required for the various positions of the thumbscrews when different lenses are employed. The stand is of novel construction, and although weighing only 1¼ lbs., is sufficiently firm. Each leg consists of three rods rivetted together near one end; the centre one swings round and is arrested by a stop when in a line with the two outer ones, which are then opened out and stretched on to the stand-head (base-board). The leverage thus obtained grips the centre leg, and with the stop renders it perfectly firm. The dark slides possess notable features. They are made on the principle now generally adopted in America, the shutters drawing completely out—an automatic cut-off, or inner spring shutter, closing the aperture through which they pass, while the shutters are made of ferrotype plates. The total weight of a half-plate camera with three double backs and 4 feet 6 folding stand is 4½ lbs.

To Correspondents.

*** A cheque for two guineas will be given for the best "Reception Room Notes—No. 3. Cash at the Time of Sitting: How I get it," to be sent in by the 1st Oct. No name need appear. For rules, see previous numbers of News.

*** Topic of the Day.—Owing to the pressure on our space, we are compelled to postpone the "Topic" this week. We have chosen the contributions of Mrs. H. Way and Mr. Alexander Beeby on the subject of "Sending out Proofs," which will appear next week.

Puzzled.—The collodion is over-iodized in relation to the strength of the bath; either use a collodion containing less iodizing solution, or employ a stronger bath.

W. S. C.—"Grammar of Lithography," by W. D. Richmond, published by Wyman, Great Queen Street, London.

J. T. N. P.—It is impossible for us to know which article you refer to, but you will find general information on the subject in Capt. Abney's "Instructions," which is published by Messrs. Piper and Carter.

One at His Wits Ends.—You should not be discouraged by a few failures, as a little care and study will put you right. Obtain Dr. Eder's book on "Modern Dry Plates," and follow the instructions accurately, and if you fail to obtain good results it will be your own fault.

X. Y. Z.—1. A hinged shutter, the flap being lifted either by the hand or by a pneumatic arrangement. 2. One on the drop principle.

George Stanham.—1. We are inclined to think that the defect arises from dirt on some of the vessels used, or perhaps the remains of previous batches were imperfectly removed. It is very undesirable to use vessels of porous earthenware, even though they may be well glazed. 2. We have found that fine muslin which is sold under the name "nainzook" answers the purpose admirably. 3. Under ordinary circumstances a temperature of 80° to 90° F. is good, but towards the end of the time the heat may be somewhat raised. 4. Very often from minute air-bubbles, or from the presence of large nodules of agglomerated bromide. 5. One part of water-glass to 200 parts of water has been recommended for cleaning the plates, this preparation not only making the emulsion flow well over the plates, but also acting as a cementing substratum. In one case, however, we noticed stains which we could only attribute to the water-glass. 6. Even double the quantity may be used without any mischief following, provided that all excess is removed by washing.

Flash Laddie.—Others have had the same experience as yourself, and considering that when the gold has been removed the remainder is practically valueless, we should recommend you to make the bath fresh every time. The waste liquors, if allowed to stand in a convenient vessel, will gradually deposit any trace of the precious metal which may remain, and this deposition may be expedited by the addition of a small quantity of sulphate of iron. 2. By means of red and blue litmus paper; the former becoming blue in the presence of an alkali, while acids change the blue paper to red. 3. Due to the presence of an organic impurity in the bath, insufficient acid in the developer, or an undue proportion of free nitrate of silver. On one occasion we traced a similar difficulty to a sample of acetic acid which was contaminated with sulphurous acid.

D. M.—Nothing is better than the usual black varnish, or a stiff water colour; this latter being easier to remove in case of a false stroke. The sky-line having been painted over carefully, a piece of orange or black paper may be used to cover the remainder.

Green Fog.—1. You should certainly use patent plate. 2. See answer to "One at His Wits Ends."

C. H. Ware.—We recommend you to provide two cameras, one fitted with the symmetrical, and the other with the portrait lens. If the light should happen to be good, you will probably obtain a satisfactory picture with the former; but the latter will serve to fall back on in case of dull weather. Direct the cameras obliquely towards the procession, so as to diminish the effect of the movement, and use a drop shutter, a small piece of elastic being so attached as to quicken the movement.

Foyle.—1. They are fixed by simple soaking in water; but if the paper is coated with flour paste before being sensitized with bichromate, a more vigorous image will be obtained. They do not fade if properly washed. 2. A solution containing equal parts of ammonio-citrate of iron and ferricyanide of potassium—say a dram of each to one ounce—is used to sensitise the paper. After exposure, all that is necessary is to wash well in water.

Mystified.—Albumen could not be relied on to cover and render harmless the pimple-like projections on the glass, and if your bath contains a small proportion of an organic poison, mischief might, and apparently has, happened. As regards the coincidence between the projections and the markings there is no doubt; therefore, we should recommend you to try a new sample of glass, or, perhaps, the application of strong nitric acid might remove the source of mischief.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1203.—*September* 23, 1881.

CONTENTS.

PAGE
Positive Pictures on Gelatino-Chloride ... 445
Instantaneous Shutters ... 445
Gelatine Emulsion Negatives for Printing in the Collotype Press. By Captain G. Pizzighelli ... 447
By-the-Bye.—A Photographic Museum ... 448
Christmas Cards, &c. By an Old Hand ... 449
Practical Hints on Saving Silver and Gold Wastes. By Chas. Cooper and Co ... 449
Notes ... 450
Topics of the Day.—"On Sending Out Proofs: What I Do, and Why I Do It" ... 451
French Correspondence. By Leon Vidal ... 452
How to Work Economically. By R. Huck ... 453
Posing for Photographs ... 453
Correspondence ... 454
Proceedings of Societies ... 455
Talk in the Studio ... 455
To Correspondents ... 456

POSITIVE PICTURES ON GELATINO-CHLORIDE.

Second Article.

In further consideration of this subject, we pass on to describe the method of preparing a chloride emulsion with ammonia, this being specially adapted for making window transparencies, as it tends to give deep brown or almost black tones; and, moreover, it is well suited for making reproduced or enlarged negatives, as the printing density can be better estimated than in the case of a reddish or bright brown tint.

In preparing ammoniacal emulsion, the same relative proportions of gelatine, soluble chlorides, and silver nitrate may be taken as in the case of the non-ammoniacal emulsion described in our previous article. To the silver nitrate solution, however, as much liquid ammonia is added as will serve to re-dissolve the precipitate which is first thrown down. The ammoniacal silver nitrate solution is then added to the gelatinous liquid with precisely the same precautions as were detailed in the directions for preparing the plain emulsion; after which all subsequent operations are conducted as already described.

The ammoniacal emulsion may also be prepared by adding ammonia to the previously made non-ammoniacal emulsion; but the treatment of the silver solution with ammonia is a preferable proceeding, as the precise quantity required is then clearly indicated by the dissolving of the silver oxide first thrown down, and, moreover, the operation becomes independent of any slight variation in the strength of the ammonia.

It is a noteworthy circumstance that fog is not in any way to be feared in the case of the ammoniacal emulsion; but when a bad sample of gelatine is used, there is a very considerable tendency for the film to frill and separate during the operation of fixing.

When the non-ammoniacal emulsion is digested at a temperature of 35° to 40° C. (95° to 104° F.), it becomes so modified as to give darker images; a digestion of twenty-four hours serving to so change it, that, instead of yielding yellowish-brown pictures when developed by ferrous citrate, it gives violet-black pictures; and, by a shorter digestion, intermediate tints may be attained.

The glass plates should be cleaned with a dilute solution of water-glass (say 1 part with 200 parts of water). A few drops of this are poured on a plate, and then wiped off with a clean cloth, the plate being rubbed until it is quite dry. When, however, a quality of gelatine has been used which possesses a considerable tendency to frill, the treatment with water-glass is not sufficient to prevent the film parting company from the glass, and the chrome-alum substratum of Dr. Vogel should be adopted. This is prepared by dissolving 1 part of gelatine in 300 parts of water, and adding 6 parts of a 2 per cent. solution of chrome alum, a few drops of carbolic acid being stirred into each ounce if the mixture is to be kept for any great length of time. The preparation is poured on like collodion, and the plates are ranged in a vertical position to dry.

As in the case of ordinary gelatine plates, it is generally advisable to warm the glasses before coating with the sensitive preparation, this being done by placing them near a stove, or, better still, by using a zinc plate-box which is constructed with double walls, the interspace being filled with warm water. The coating is most easy to perform when plates and emulsion are at the same temperature.

Few special remarks are needed respecting the coating and drying of the plates, but it is worthy of note that each square centimetre of glass should retain about 0·036 cubic cent. of the emulsion (about 3¼ grains to each square inch).

When dry, the ammoniacal plates appear almost opaque, and are greyish blue by transmitted light; while the non-ammoniacal plates are much more transparent, and transmit a reddish yellow light. Even when very thickly coated, they appear much thinner than bromide plates, but vigorous images appear on development, although the coating of emulsion may be very thin.

The dry plates may be preserved in light-tight boxes, or preferably be wrapped in brown paper, each pair of plates being placed film to film; but care must be taken not to scratch or damage the sensitive surface. The authors consider it unadvisable to place a sheet of paper between the films, as irregularities in development often result from such a proceeding; but strips may be placed between the edges to prevent contact. It is, moreover, a very excellent plan to dust each plate with a camel's hair brush before packing. The plates thus prepared and packed, keep well; it being, of course, understood that such obviously injurious agents as light and moisture are properly guarded against. When, on the other hand, chloride plates have been prepared with excess of silver nitrate, these being sometimes useful for direct printing without development, the keeping qualities are very limited.

An exposure of one to three seconds under an average negative is generally required when the printing-frame is uncovered in diffused daylight, the ferrous citrate developer being made use of; while thirty minutes at a distance of five feet from a bat's-wing burner may be regarded as an average exposure when gas-light is used.

The preparation of the ferrous citrate developer, and the development of the latent image, will be treated of in our next article.

INSTANTANEOUS SHUTTERS.

The season for instantaneous work may be said to be past, and it may be thought that we have chosen an unfit time to draw the attention of photographers to the instruments in use for effecting very short exposures. This is not our idea, however. The time of year is fast approaching when the mechanically inclined photographer, whether he be professional or amateur, will have a considerable amount of leisure to devote to scheming out mechanical contrivances in connection with his hobby, and we would therefore say a few words on what we consider the requirements of a perfect shutter, and also would pass in review a few of the shutters at present most used, noting what they fulfil, and in what they fall short of our ideal.

When we say that we do not consider that there is a perfect shutter for landscape work at present in existence, we do not wish in any way to reflect upon the ingenuity of those who have contrived the very clever appliances now in use. Many of these are not only deftly devised and constructed, but are practically of great use, and it may be that it is physically impossible to combine in one instrument all the qualities which we shall enumerate.

This is all said in reference to a shutter for landscape purposes; but before going into the question of such an instrument, which must of necessity be at least a little complicated, we would consider what are the requirements for a shutter to be used in the studio.

The conditions here are far more simple than in the case of work including rapidly-moving objects in the open air. The subjects are, comparatively speaking, uniform in character; the exposure need not be very short, nor need it vary much, if at all—that is to say, it is quite possible to use only one length of exposure (say a quarter or an eighth of a second) when a shorter exposure than a band one has to be given.

It has been pointed out before now that an instrument which could be set to give any exposure from (say) a tenth of a second to (say) a minute, would be very desirable, and so no doubt it would. Setting this idea—which would, we imagine, necessarily involve a clockwork machine of some kind—aside for the present, we shall consider what is the simplest form of shutter that will satisfy the requirements of the photographer for studio work.

We think it may be said that where a very short exposure is not required, there can be no simpler nor better instrument than Cadett's flap shutter. Exposures can be given with this instrument probably as short as half a second, and with a little practice sufficient exactitude for practical purposes may be attained. Briefer exposures than this must not, however, be attempted, as the rapid action is apt to shake the camera.

If shorter exposures than this be wished, we consider the simplest possible form of drop shutter will satisfy all conditions, and as it is not necessary that the shutter should work in a very small fraction of a second, nor yet that it should be very portable, it is the more easy to fulfil one condition which we wish particularly to emphasize, as we consider it of very great importance, whatever form of shutter is used, for whatever subject it be used, and wherever it be placed in relation to the lens, unless, indeed, it work quite close to the sensitive plate—it is, that the opening in the moving part of the shutter should be several times as long in the direction of its motion as the diameter of the lens.

The reason for this is that, for the same length of exposure, a greater amount of light will be admitted than if the aperture be short. To put this in other words, we may say that if the opening consist, as it commonly does, of a hole the same diameter as the lens the length of exposure required to produce a certain actinic impression will be just double what would be required were the opening of indefinite length.

It is quite evident that if the opening be not longer than the diameter of the lens, the shutter is either opening or closing during the whole time of the exposure, and that the whole power of the lens is only allowed to act during an indefinitely short period.

Of course it is impracticable to have an indefinitely long opening, but it is easy to have one several times as long as the diameter of the lens. If it be only twice as long as the diameter of the lens, it will allow half as much light again to pass in an exposure of (say) a quarter of a second as if it were a circular hole or a rectangular one only as long as the diameter of the lens.

We think we will make the advisability of fulfilling this condition evident when we say that by using an aperture three times as long as the diameter of the lens, a portrait combination of ordinary rapidity will let the same flood of light fall upon the sensitive plate in a quarter of a second as would pass through a "rapid" portrait lens in the same time, if the aperture were only the diameter of the lens; whilst in the latter case there would not be the advantage in gain of definition and depth of focus which would arise from stopping the lens down to the same diameter as the ordinary lens.

Supposing a three-inch lens to be used, we would recommend that the aperture in the moving part of the shutter should be nine inches long, and should be as wide as the diameter of the hood.

It must be kept in mind that the exposure begins when the lens begins to be uncovered, and does not end till the lens is completely covered again; so that in this case the exposure would last whilst the shutter was moving through twelve inches. A falling body moves, theoretically, twelve inches in the first quarter of a second, and practically, if all friction except air friction be eliminated, a body falls at very nearly the theoretical speed for the first few feet, so that the exposure with such a shutter may be said to be one of a quarter of a second. This may be considered by some to be too long, and certainly for some subjects it would be. The course which most would follow, if a shorter exposure were wanted, would be to shorten the aperture in the moving part of the shutter; but we think we can point out a less objectionable plan than this.

The effect of allowing a shutter to move for a comparatively short distance *before* it begins to open is to make the exposure very considerably shorter. Thus, with the dimensions of shutter which we have just given, if the shutter be raised so high that it has to move three inches before the exposure commences, it will move the twelve inches required in about one-sixth of a second; whilst if it be made to move six inches, the exposure will be shortened to very little over one-eighth of a second, which is quite quick enough for any studio work.

As regards the manner of actuating the shutter, it is almost unnecessary to say that means should be provided for doing so without either touching the shutter with the hand, or of taking the eyes off the subject. An electrical arrangement may be very easily fitted up for the purpose, but, on the whole, we think Cadett's pneumatic arrangement is quite as good, and is certainly simpler.

Unless the moving part be very heavy, there need be no fear of its shaking the camera. There will necessarily be a shock when it is brought to rest, but as the exposure is then over, it is of no consequence. Theoretically, there is a motion when it commences to move. This is exactly equal to what would be produced if some object of the same weight as the moving part of the shutter, placed upon the lens, were suddenly lifted from it. Studio cameras are usually so rigidly fixed that unless some very heavy material be used, it may be entirely disregarded. As regards material, nothing can be better than ebonite, and it is possible to arrange it in such a way that there shall be practically no friction.

As to position of shutter—before, behind, or between the lenses—we consider that, except for convenience, it is a matter of indifference which position be adopted for *portraiture.* It is otherwise in landscape work, but we shall consider this when we come to treat of shutters for out-door use. If the shutter work either before or behind the lens, it should be as near it as possible, unless it work close to the sensitive plate.

GELATINE EMULSION NEGATIVES FOR PRINTING IN THE COLLOTYPE PRESS.

BY CAPTAIN G. PIZZIGHELLI.[*]

In the course of some experiments, undertaken by Dr. Eder and myself, on the use of potassium bichromate in the gelatino-bromide process, we discovered a method of rendering fit for intensification negatives which, after being intensified in the ordinary way, were not sufficiently dense. This method, as already published in this journal,[†] consisted essentially in placing the negative in a solution of potassium bichromate, then exposing the reversed side to the light until the drawing became faintly visible on a piece of silver paper laid on it, afterwards washing, and finally intensifying with the ordinary pyrogallic intensifier of the wet process. By means of this exposure of the reversed side to the light, the transparent parts of the negative become horny, and are not affected by aqueous solutions (especially by the intensifier), while the dark parts in immediate contact with the glass are rendered insoluble, though they retain the power of swelling up, and therefore remain liable to be acted on by the intensifying solution.

Since a gelatine negative treated in this way possesses generally the same properties as a collotype plate, it naturally occurred to us to try it in the press with fatty ink. Our first attempts in this direction were not successful, since (1) the gelatine layer on being rolled up separated from the glass; (2) the colour on the negative ran in the press, so that the inked parts could scarcely be distinguished from those which were not inked; (3) by drying at ordinary temperature the negative which had been steeped in the potassium bichromate solution, the formation of the necessary grain was prevented. Negatives of this kind could indeed be printed from by taking great pains, but then only provided they contained very fine lines, which, when the relief was produced by washing, became of great depth, and so fitted to retain the ink. When the lines were coarser, or the flat spaces larger, the ink was in great part carried off again by the roller, and the prints obtained were grey and weak. In order to make the process a success, therefore, it was necessary to make it comply with the following conditions:—(1) The adherence of the gelatine film to the glass must be brought about by using a proper substratum; (2) a grain must be produced in the negative capable, as in a collotype plate, of retaining the printing ink; (3) the dark colour of the negative due to reduced silver must be entirely removed immediately before its being submitted to the collotype press.

1. *The Substratum.*—The substratum which I have used for years for collotypes proved itself to be well adapted for the present purpose; it consists of 100 cub. cent. beer from the cask, and from 8 to 10 cub. cent. soluble glass. It is prepared by mixing the two liquids in a flask, then shaking up well, and placing it on one side for half-an-hour to settle, afterwards filtering through paper into a beaker. The requisite quantity of this solution is poured on a plate placed in a horizontal position; it is distributed with the finger, and any excess drained off by rapidly placing the plate in a vertical position, with one corner over another beaker. This operation of coating the plate is repeated, and the draining effected by another corner, the plate being then placed upright to dry. In warm, dry weather, the drying may take place automatically, but when the atmosphere is damp and cold, it is better to have recourse to a drying-box, or to place the plate near a stove or fireplace, at a temperature of about 30° C. When the plates are dry, they must be washed in a jet of water for one or two minutes, and then again set to dry. Plates which after this operation have a faint, dull, opalescent appearance by reflected light, can be used either for the preparation of collotypes or of negatives. Coating them with gelatine emulsion is effected in the usual way.

2. *Formation of a Grain.*—To dry the negative, after it is soaked in a solution of potassium bichromate, in the drying box at a high temperature, is not possible, for such a proceeding would cause the gelatine film to melt, and thus destroy the negative. Rapidly drying in a current of air produced by a powerful fan would probably yield the required grain, but as such a fan is not at every one's disposal, I recommend the employment of a simpler and more readily available means. After many ineffectual attempts, I hit upon the plan of postponing the fixing of the negative: first develop and well wash it, then bathe it at once in the chromate solution, and treat it generally in the manner above described, and make the fixing the concluding operation.

To this idea I was led by the consideration that the operation of fixing must, after the undecomposed silver bromide has been removed from the parts of the gelatine film which have been unaffected by light, produce a diminution of its volume, and as the film adheres firmly to the glass plate, this diminution will show itself by a contraction of the film in a direction at right angles to the surface of the plate.[*] Now if the parts which, during exposure, have not been acted on by light (though they contain undecomposed silver), lose, partially or entirely, their elasticity by means of the treatment described in the introduction, they cannot, at the time of fixing, contract regularly and evenly, but they must split open more or less, according to the extent of this exposure. But this splitting or cracking is the same thing as the grain in a a collotype plate, and therefore must produce the same effect.

Experiments made in this direction completely substantiate these views. A negative simply developed, then treated with a chromic salt, printed from the reverse side, and washed, was found to possess, on fixing, the necessary grain. For the chromate solution the proper strength was found to be 900 parts of water to 30 parts of potassium bichromate. This solution must be kept as cool as possible—if necessary, by means of ice—and the negative, after being well washed, is then, either in the wet or dry state, bathed in it for about fifteen minutes; it is then allowed to drain, and all excess of the solution is removed by dabbing with a soft cloth. Being then placed in a well ventilated room at the ordinary temperature, it will dry in the course of a few hours.[†]

In order to print it, the negative is placed, as in the usual copying process, in a printing-frame, and covered with ordinary sensitive paper; it is then exposed to the action of light until a faint image of the whole appears on the sensitive paper. On account of the yellow colour of the chromic salt, and of the silver bromide still remaining in the negative, the printing takes a considerable time, and sometimes lasts over a whole day. So soon as it is complete, the negative must be washed, and after the yellow tint due to the chromate has been got rid of, it is fixed in the usual way.

3. *To Remove the Dark Colour of the Negative.*—For this purpose I prefer the method indicated by Dr. Eder and Captain Toth,[‡] by means of which the image on the gelatine-bromide of silver plate is transformed into one of silver chloride. I take the negative after it has been treated in the way above described, and immerse it in a solution of 1 part potassium bichromate and 3 parts hydrochloric acid, in 100 parts water, leaving it there until the black colour has entirely disappeared—that is, until the whole of the silver has been converted into chloride. The negative must then be washed, and afterwards fixed a second time;

---

[*] *Photographische Correspondenz.*

[†] *Ibid.*, 1881, p. 62.

[*] That this contraction really takes place may be seen in every gelatine negative, in a wet as well as in a dry state, by the transparent (that is to say, the unexposed) parts becoming deeper and lower than the exposed parts, which contain the silver reduced to the metallic state.

[†] This is very necessary, for if it be not properly effected, the chromic salt is liable to crystallise out during drying.

[‡] *Photographische Correspondenz*, 1881, No. 211, p. 122.

this has the effect of dissolving all the silver chloride, and no silver remains on the plate, nothing but pure transparent gelatine, in which the picture, as in a collotype plate, is only visible by means of the grain. After the plate has been again washed and dried, it may be used for printing from with fatty ink like an ordinary collotype plate. Instead of washing the negative after it has been printed, it may be at once plunged into the solution for getting rid of the colour, as described above, and by this means the double operation of fixing can be dispensed with. If at the first attempt all the silver is not directly converted into the chloride, the operations of discharging the colour and fixing may be repeated, in which case the washing between the two manipulations need only be superficial.

This process, which is by no means so laborious in reality as it would seem to be from the description, is principally adapted for copying line drawings, and more especially for producing from negatives of very delicate drawings, transfers for the lithographic stone; by this method they are obtained certainly much finer than by the ordinary photo-lithographic transfer process. For this purpose the ordinary lithographic transfer ink should be used, and as support for the transfer, the ordinary scraped paper of the lithographer, or, with advantage, gelatine paper used in photo-lithography may be employed.

By-the-Bye.

A PHOTOGRAPHIC MUSEUM.

The good news comes to us from Paris that a museum of photography is about to be formed in connection with the Conservatoire of *Arts et Metiers.* All objects having historical value, whether in connection with Niepcotype, Daguerreotype, Talbotype, or Collodiotype—to coin a word that historians will want—are eagerly sought for, and no efforts will be spared to make the collection as complete as possible. Even the recent gelatine process will not be forgotten. It is not likely, however, that the possessors of photographic relics in this country, much as they may desire to see the formation of a photographic museum, will be willing to send over to France their own cherished belongings, more especially as Britain can claim its full share in the discovery of the art as it is now practised; and for this reason we hope that the day is not far distant when endeavours to a similar end may be made on this side of the Channel. We cannot claim Nicephore Niepce and Daguerre as countrymen, but Wedgewood and Davy, Talbot, Herschel, Ponton, Reade, and Archer, to mention half-a-dozen names that readily occur to the English-speaking student of photography, suffice to show that the discovery of photography is one in which all true-born Britons must feel an interest.

Indeed, we fully believe that in this country are to be found the materials for making a more complete historical collection than in any other. To begin with Niepcotype—for until the camera came into play, photography had little significance—it is highly probable that some of the best specimens are scattered about Great Britain, if they could only be brought together. In was in 1823 that Niepce succeeded in discovering a method of producing permanent photographs by means of bitumen of Judea, although it is true, mention is made in his writings of the material in 1820. He coated a metal plate with the bitumen, and after exposure to light developed it with so-called animal oil of dippel. He took some of his specimens to Paris in 1825—for we have evidence that they were shown to Chevalier in that year—and brought others to England in 1827, when he came to this country to visit a sick brother. We may infer, indeed, that he brought a very large number of pictures with him, for he submitted his process to the Royal Society, and made several attempts to sell it. Moreover, he worked with the camera here, taking a picture of Kew Church, which has since become historical. This must have been done in 1827 or 1828, for he departed in the latter year. The Niepcotypes, their discoverer exhibited to all the notables in London, at the Royal Institution, and at the Royal Society. Some were left in the possession of Mr. Bauer, the Secretary of the Royal Society, and it is but the other day that Mr. Robert Hunt assured us he was confident they still formed part of some collection in this country. Faraday saw the picture of Kew Church at the time of Niepce's visit to England, for years afterwards when the latter was dead, and the first Daguerreotype was placed in the English philosopher's hand, he recalled the circumstance. "You have never seen anything like that before, I am sure," said Mr. Bauer, as he handed Daguerre's picture to Faraday. But to the Secretary's astonishment, Faraday replied, "Yes, I have; I saw a picture of Kew Church very much like it. A Frenchman showed it me, and he said the light did it."

Among others, Mr. Ellis, of Balcome, possesses a specimen of Niepcotype, but, strange to say, there are none at the British Museum, where we ourselves have made search. The Royal Society may have some Niepcotypes among their archives—those left with Mr. Bauer—but of this we are not sure.

Of early cameras there are many examples in existence, but then the *camera obscura* and *camera lucida* were well-known objects in the last century. Lenses are of more recent construction, for although many fine objectives were made prior to the days of photography, it is only within the last thirty years that the more perfect camera instruments were made. In the early lenses there was no reason for caring for the actinic focus at all, nor was there any purpose to be gained in securing flat field or depth of focus; only when photographers called for these improvements were they forthcoming.

Very early Daguerreotypes—to make the next step—are by no means prolific. Of portraits of Daguerre himself there were, we believe, only three extant prior to the publication of the Year-Book of Photography for 1881. But a fine collection of Daguerreotypes could be made without difficulty, especially if the houses of Claudet, Mayall, and Beard could be induced to contribute.

In the same way the Talbottype process might be most effectively illustrated, for well preserved negatives are in the hands of many early students of photography. At Lacock Abbey there is a large collection of relics connected with the early experiments with photogenic drawing, as it was at first called. The creation of a negative, and the printing therefrom of positives—the photographic process in general use at the present day—we have from Fox Talbot, and Fox Talbot alone; all earlier attempts of multiplying light-pictures by Niepce and Daguerre were by surface printing or helio-engraving. Some of Fox Talbot's first negatives would therefore be of high interest, since they form the keystone of the photography of to-day.

Sir John Herschel's share in the discovery of photography could not be so well recorded in a museum, albeit his introduction of hyposulphite of soda as a solvent of the haloid salts, his investigations into the iron and gold salts, and his suggestion to employ glass for photographic negatives, are among the most useful and important contributions to photographic history that can be chronicled. In the same way Mungo Ponton's discovery anent the action of light upon the bichromates is one that a museum could do little justice to, save by exhibiting examples of the reaction in question. The Rev. Mr. Reade's discovery of the properties of gallic acid for development might, on the other hand, we believe, be adaqnately represented, for, if we mistake not, one of his original results is still in the possession of Dr. Diamond. The bath employed by Archer in his first collodion experiment we had in our hands the other day, for it is the property of Mr. H. P. Robinson, of Tunbridge Wells.

Unfortunately, there is a good deal of apathy on the part of our existing museums to make a collection of this kind.

To induce the authorities of the British or South Kensington Museums to purchase objects of value, it is necessary to bring influence to bear. Many thousands of pounds are annually expended in the acquisition of mementoes and objects of interest, but the purchase is generally a matter of favour as much as anything else. Some time ago Madame Niepce de St. Victor brought to England a valuable collection of photographs in colour, a series produced by Niepce de St. Victor, who shares with Becquerel the honour of having more nearly solved the problem than any other experimenter. The pictures in question were photographs, taken in the camera, of dolls dressed in coloured raiment, produced by means of the so-called violet sub-chloride of silver after prolonged exposure. The pictures were then seven years old, and although only capable of exhibition by candle or subdued daylight, they represented the most interesting results yet produced in this branch of photography. But none of the museums of this country would purchase a specimen, albeit Madame Niepce de St. Victor would gladly have parted with them for a reasonable sum; it is now questionable whether the British Government could acquire any of them for love or money.

In the formation of a museum of this kind, it is absolutely necessary, as we said in connection with a national photographic gallery, that time should not be lost. Objects which now might be had for the asking, it will be impossible to beg, borrow, or steal a few years hence. Old apparatus, proofs, and pictures lying by and forgotten, are easily lost sight of. They come into the possession of those who know not their value, or take little interest in their history. They are often treated as lumber and rubbish, until too late for recovery. We do not know whether it is within the power of the Photographic Society of Great Britain to make a collection of photographic mementoes, but if it is, that body, if it but commenced the work, would earn the gratitude of many photographers who take something more than a material interest in their art.

The "At Home" next week will be "Fritz Luckardt in Vienna;" the following "By-the-Bye" will be on "Business Tact."

CHRISTMAS CARDS, ETC.

BY AN OLD HAND.

As there is a great demand for such things at the time now approaching, many industrious and pushing photographers may add to their incomes by devoting some little time to their production.

The want generally felt is for *local cards*—cards with some ancient church, old hall, way-side cross, or other object of interest peculiar to the district. If such things were neatly and cheaply got up, a remunerative sale would probably follow. There are great quantities of very good things of the kind in the market, but they are *general*, and, in very few instances, *local*.

Many methods of production have been published in the News, which, if carefully followed, would lead to very satisfactory results. The method we are about to propose is a very simple and inexpensive one, and in the hands of a great many may be artistically carried out and made profitable. The designs for forming a border round the cards can be made by drawing the same on tracing-paper known as *clarified vellum*, or by using any of the lace and perforated cards, putting various parts together so as to form one effective whole. They can be made and arranged so as to form any useful or convenient size; the blank spaces, as ovals, rounds, or panels, in proper places can be introduced. Any small photographs of places or objects that may be found at or near the place where the card is published can be put in the panel spaces. "Wishing you a Merry Christmas and Happy New Year," or "With the Compliments of the Season, from——," can be introduced either by printing in the same, or inserting it with a clean pen and parti-coloured inks, or gold ink. Such as have skill at this—and they are many—may readily produce some good and presentable effects. Many lady-amateurs would probably like to have cards with the blank spaces left, so that they could introduce and insert any design or writing of their own that they might wish.

The paper or cards for brown or drab impressions must be coated with a solution of bichromate of potash, either saturated (or weaker) according to the depth of tint needed; blue impressions will be produced by using citrate of iron, and ferricyanide of potash, 70 grains of the former to 60 grains of the latter in one ounce of water. After drying and printing in a pressure-frame, the proof need only be washed in clean water, and dried. Nitrate of iron, nitrate of copper, nitrate of silver, &c., may be used according to the skill of the operator in such matters. The Pellet paper, the bromide paper, &c., might be also found of service; but for simplicity and small cost, the two first solutions named are the most simple and best.

PRACTICAL HINTS ON SAVING SILVER AND GOLD WASTES.

BY CHAS. COOPER AND CO.*

It is a fact that only about five per cent. of the gold and silver used in producing a photograph remains on the finished picture; the balance is lost, and in giving below a few short and simple methods of saving and reducing photographic wastes and residues, we believe we confer a favour upon some of the fraternity.

Old baths and the washings of the prints should be precipitated with ordinary salt, thereby forming chloride of silver. Add the salt gradually, stirring up the solution, until it forms no longer a precipitate, which you may easily determine by taking a sample of it in a tumbler or white bottle, holding it up to the light when adding a little salt. Don't add too much, as an excess will re-dissolve the chloride. When the silver is all down, pour in a little acid, either nitric, sulphuric, or muriatic, which will clear the solution; allow it to stand for about twenty-four hours, then draw off your clear water, and you have the chloride on the bottom of the vessel.

The hypo or fixing solution is very rich. It should be precipitated with sulphuret of potassium previously dissolved in water, also adding it as long as it will form a precipitate. The latter, when down, may be thrown on a plain muslin filter to allow the water to drain off. Such a filter may be readily constructed by taking a piece of common unbleached muslin, say a yard square, tying loops to the four corners, and hanging it up on sticks.

A good many photographers are in the habit of precipitating their washing solutions with metallic zinc expanded in sheets therein. The action of zinc, however, is slow, and must be accelerated by acidifying the solution. Now it frequently happens that the fixing solution is allowed to run into the same vessel, and, the hyposulphite being an alkali, suspends the action of the zinc. In the course of time a deposit out of the water is formed; but the happy proprietors of the "mud" are sadly disappointed in its value, as it is sometimes even so poor as not to pay for the trouble of refining.

All prints should be trimmed before toning, as it saves gold, and, besides, toned paper is of hardly any value. Keep the untoned clippings and filters clean by themselves; do not throw sweepings, pieces of glass, and spoiled ferrotype plates among them, as their bulk only decreases the real value. If you wish to burn the paper, have your stove cleared of cinders and ashes, and proceed slowly, for a good draft will carry many particles of silver through the flue.

Your toning solution throw down with sulphate of iron, but be sure and have the solution "acid," as otherwise the iron will be precipitated, and your gold goes where the "woodbine twineth." Save your developer and collodion skins; they will also amount to something in the course of time.

We have likewise found that the wood of barrels which contained waste solutions for a number of years was quite impregnated with silver, some barrels yielding as much as thirty ounces of metal; so, when yours are unfit for further use, you know what to do with them.

Last, but not least, do not send small lots of waste to be refined, but wait until you have a reasonable quantity for expenses, and charges are then comparatively less.

---

* Philadelphia Photographer.

Notes.

Our correspondents who have requested information upon the subject of the Pall Mall Exhibition are referred to the regulations in another column.

News has been received of Mr. W. J. A. Grant, who sailed some months ago in the *Willem Barents*, on his fourth voyage to the Polar seas. The intrepid photographer has not been so fortunate as on former occasions. Owing to the continuous ice barrier, which extends nearly to Norway, Spitzbergen could not be reached, nor yet even the Bear Islands; one more attempt to force through northward will be made, and then the expedition will return home, as the captain is convinced that this year Novaya Zemlya is completely enclosed in a barrier of ice.

Our "At Home with Fritz Luckardt" will be followed by a description of one of the first studios in Unter den Linden, Berlin—that of Herr Prümm. Afterwards will appear, "At Home with Dr. J. M. Eder, at the Technical High School, Vienna," in which we shall have something to say of the eminent photographic chemist who has made a name for himself in his country as the author of "Modern Dry Plates," and as one of the most thorough investigators of photographic science.

The death of Major Anderson, R.E., C.M.G., is announced. He was the first to organise an equipment of military photographers for active service in this or any other country; in effect, the success that attended the photographic staff attached to the Abyssinian expedition was mainly due to Major Anderson.

The British army is the only one that includes in its equipment a travelling photographic laboratory. This is at present fitted especially for wet plate work, but doubtless gelatine will now be assigned the place of honour.

No army corps in this country—a body of some 36,000 men—is considered perfect without its complement of army photographers, who are trained men from the Royal Engineers. The photographic van is a compact little office on four wheels; it accompanies the headquarters, drawn by a pair of horses, one of them ridden postilion fashion by a soldier. The van may be used as an office, having window, seats, and desks; or as a photographic laboratory, for which purpose special glass windows, sink, and taps are provided.

Whether instructed to take views or portraits, to copy maps, or print in photo-lithography or silver in the field, the military photographers are in a position at once to carry out orders. A most complete set of apparatus is included in the outfit, and there is an ample stock of chemicals for the making up of formulæ. It was in the Abyssinian campaign that a body of military photographers took the field for the first time; they were capitally equipped on that occasion, even down to a copy of Hardwich, and the pictures brought home, it may be remembered, were decidedly creditable.

There is talk in Germany of reviving the manufacture of collodio-chloride paper. Many photographers in this country will be glad to hear it.

Major E. S. Gordon, R.A., has forwarded us a pamphlet that is likely to prove of considerable value to travellers and explorers. It details in a succinct manner the readiest means of fixing one's position in an unknown locality, by the most simple astronomical observations.

Two theatrical items. At the new house in Great Queen Street, the "Novelty," we are promised, besides a gallery of paintings in the foyer, a studio in which photographs will be taken by the electric light. This will be a great boon to patrons of the drama, for during the progress of a bad play they will have the satisfaction of knowing that their visit to the theatre is not entirely in vain; they can at any time quit their seats and have their portraits taken.

The other piece of good news is that our friend, Mr. J. W. Swan, has entered into an amicable arrangement with Messrs. Siemens, Brothers, the well-known electricians, they to employ his lamp, and he to use their apparatus. In company, they are to light up the new theatre in Beaufort Buildings with electricity, three hundred of Mr. Swan's lamps being used on the stage and in the auditorium. At the Paris Electrical Exhibition they are making a fuss over the model of a theatre lit up by electricity; in London we shall have the real thing.

High studios *versus* low studios is a subject that has received much attention in Germany of late, the general verdict, as might have been expected, being in favour of low roofs. In several lofty studios a false floor has been constructed, in order to raise the sitter towards the roof. Many may remember Adam Salomon's dictum: "As to photographic portraits, they could be best taken under a cucumber frame, if it were only possible."

The days of silver printing are by no means numbered. In this country, certainly, pigment-printing and platinotype have many strenuous disciples; but on the Continent, whether it is a tiny carte portrait or an enlargement upon paper or canvas, silver printing is used throughout. The Lichtdruck process, much as it is worked, is not used by the ordinary photographer.

Three convictions were recorded at the Central Criminal Court last week, upon persons who had removed the writing and figures from cheques, and substituted greater amounts. It is almost impossible to remove ink from paper without leaving behind a faint yellowish stain, which, if inappreciable to the eye, is at once detected by photography. We have several times photographed paper which has been tampered with, and never failed to detect the imposition. A sensitive plate, it should always be remembered, affords the best and readiest means of discovering either erasure or bleaching upon a document. The Bank of France invariably employs photography for the purpose.

Captain Pizzighelli's clever method of transforming a gelatine negative into a printing block fit for the collotype press—described in another column—is well worthy the attention of advancing photographers.

The panel or promenade portrait has obtained a new lease of life in mid-Europe, chiefly from the fact that it has been called after Makart, the Viennese painter who is so popular just now. Throughout the great Fatherland, as also in Austria and Hungary, the Makart has now taken a firm hold.

The Boudoir portrait, which is also popular in Berlin at any rate, and likely to become a recognised style, is as long as the Panel, but broader; shaped, therefore, more like a Cabinet. It is better adapted for sitting portraits and groups than the Panel. If the Boudoir should come to be a popular form with us at home, we earnestly hope the name may be retained, for there are already appelations enough of this kind to upset a well-balanced mind.

Our readers may like to know that *cartes emaillées*, or portraits glazed with gelatine, which are still exceedingly popular in France, are regarded with little favour by German-speaking communities. In only one first-class studio did we see specimens during our recent tour.

A Manchester studio story. She was a woman dressed in rusty black, of about thirty-five to forty, still sufficiently good-looking, with clear blue eyes, and brown hair smothened under her black bonnet; but I did not like her shifty manner. She asked if I copied Daguerreotypes, and, on my replying in the affirmative, made a great fuss before showing what work she wanted done. She bargained, too, for a copy for two shillings, and that I kept the portrait but half-an-hour. At last, in a fit of nervousness, she brought out a brooch picture in an old-fashioned gold setting. She would wait till the job was done, she said.

It was a Daguerreotype plate, perforated with holes all round to receive the heavy gold mounting, so that portrait and precious metal could not be separated. I at once guessed the truth—that the brooch was stolen. The picture was a very bad one of a gentleman with a black beard, and a child whose only marked characteristic was a skinny arm round her father's neck. As I went on with my work, I felt more and more convinced that I was right. Indeed, in the end, I hesitated between communicating with the police, or telling her my doubts straightway.

I chose the latter alternative. Turning quietly to her, I said: "You have stolen this picture, and you know it." I was right. In an instant the woman was at my knees, begging me to give her back the portrait, and she would confess all. My answer was that I should keep it till I found the owner. She implored for its immediate return. "It is the portrait of my daughter; I am an outcast from home, and took it only to get it copied. If he comes back and finds it gone, he will know it is I who have stolen it."

Topics of the Day.

"ON SENDING OUT PROOFS—WHAT I DO, AND WHY I DO IT."

BY MRS. E. H. WAY.

The subject of proof showing is a question on which the very greatest difference of opinion exists.

An extended experience of the business department of photography has convinced me that in a good-class establishment, showing of proofs is absolutely necessary; and the higher the social standing of the customers, the greater the necessity for conceding to them this right of choice.

As first indicated, my opinion is, that with those who have ideas on art, or fancy they have, which is much the same thing, it is absolutely necessary to give them proofs in some form or another. A great deal also depends on the character of the manager of the studio. If he is a perfect master of his art, and *possesses implicit reliance on his own judgment*, it is most likely he can better please the majority of his customers by not giving them proofs; but, as will be seen, this is more or less an arrangement between the artist and the sitter. The conditions necessary for this very unusual state of things may be thus briefly stated: on the one hand, an artist who has the talent for producing pleasing pictures, who is conscious of his power, and has the art of convincing others; and, on the other hand, customers who can recognize the power of a superior mind, and are willing to bow to its decisions. This is an extremely rare combination, it will be admitted. The alternative to proof showing—the making a charge for the first print from a negative—is only possible in second or third-rate studios and business thoroughfares.

By this practice the photographer secures (say) half-a-crown for each sitting, a (more or less) finished proof being furnished the sitter in return for his money. If the picture happen to please the sitter, a further order of pictures from the negative may be given; or, failing complete satisfaction, the sitter may try again. Two great advantages the photographer reaps by this system: first, there are no re-sittings, save on account of accident; and, second, he gains the custom of a large class who like sitting for photographs, and are fond of seeing "how they look" every week or so. This, however, is not suitable to first-rate business, and here we must concede that it is at least *expedient* to furnish proofs to sitters. I think the great fault with those who resent the necessity for proof-showing is, that they do not look upon it as a business expense insignificant in the year's business, but allow themselves to become prejudiced by the abuse of privilege of some awkward customer.

Then as to the character of the proof: shall it be toned or untoned, retouched or rough? I am decidedly of opinion that rough proofs are worse than useless, and only work more harm. If they are untoned, the sooner they fade the better. How is it possible for the ordinary sitter to judge of such a picture, and make proper allowance for the possible improvements which will be effected in finishing? As well place us before a block of marble, and say: "That is going to be a beautiful statue; what do you think of it as a work of art?"

Rough proofs should *never* be allowed to pass outside the gallery. If required in a hurry, and the sitter is willing to judge only of position and details of dress, a proof may be made in fine weather, while the sitter waits, by coating the negative, while still wet from washing, with a weak solution of mucilage in water, drying thoroughly, and then taking an impression. The rough proof thus made cannot be mistaken for finished work, and if misunderstanding arises, the artist is at hand to set the matter right. If the negative is coated with the gum solution, it may be retouched directly it is dry, and the rough blemishes of the negative removed. This need not, in most cases, take long to accomplish. The printer may then make a proof, exercising all his art to get the finest results, tone and mount, nicely burnishing and finishing the picture, so that, in all mechanical details, the print is as good as the house is capable of producing. It is then sent out with a notification that the picture is not a perfectly finished one, but is intended to give the sitter opportunity of judging of expression, position, &c., &c.

On the return of the proof, if satisfactory, the negative is varnished, and the retouching completed; the proof is sent to the printer with the order, and is returned with the last batch of prints, which I expect to be of the same tone and depth of printing as the approved proof. My practice is to keep all proofs at the studio for reference, so that in the event of further orders no mistake in the picture wanted can be made, and by sending the proof with every order the printer may know exactly what results are required.

Even with a partially finished print, every effort should be made to secure its return; if you are at all careful for the reputation of the business, the best way being by placing double price upon it, notification of which should appear in the circular accompanying it, or printed on the back. I object to the defacement of the print by writing across it the word "specimen."

Record of date of sending out and receiving back proofs should invariably be kept, as a check on the printers, and for reference in cases of complaints of delay.

BY ALEXANDER BEEBY.

Perhaps there is no subject connected with photography about which there is more diversity of opinion than that of sending out proofs. So much depends upon the kind of business done, and upon the kind of people who support the business. What would answer admirably in one studio, might be altogether unsuitable in another; therefore, in saying "what I do," I am merely going to state my general practice, and disclaim any intention of setting up my course as the only right and proper one.

One principle I maintain is, that in whatever business you are, it should be your duty (certainly your policy) to please your clients; and whatever hard and fast rules you may lay down, those rules should be proved by, whenever it is necessary, making exceptions.

A customer sits for his portrait, and I will assume a good negative is the result, one with which I am pleased myself (for unless I am satisfied, I have doubts about satisfying my customer—as Mr. Jabez Hughes says, "I think it will do," won't do at all in good photography). I don't show him the negative unless he particularly wants to see it, for it is impossible for him to see it with my eyes; and with his own, as a rule, he is incapable of judging whether it is good or bad. He then says he wants so many copies, but would like to see a proof first. I tell him a proof shall be sent him on such a date, always allowing myself good time, for I am not going to send him an untoned spotted piece of red paper. No, I take the same trouble and time with that negative to produce the proof as though the order were a dead certainty, and there was no possibility of a re-sit; and it pays. I satisfy myself about the negative in the first place, and nine times out of ten the customer is pleased too.

I have no doubt but that many and many a re-sitting has arisen through the customer receiving what many are pleased to term "a rough proof." He cannot make the allowance that should be made between the rough proof and the finished picture, and then, without quite knowing what it is he objects to, he makes some general objection, and thinks he had better sit again, and with some people that means going through the whole thing again, having him in your studio when you would much prefer seeing someone else, and having yourself a feeling all the time that perhaps this attempt will be no more successful than the first. This kind of thing repeated gets monotonous. On the other hand, the negative being varnished, what retouching it needs should be done, two or three copies printed off, and toned. You need not be particular to a piece of paper or two, nor need you expend 30s. in making £1; but two or three copies should be done, from which the best should be selected, mounted, spotted, and burnished, using care throughout to give the portrait complete finish.

The something that gave offence in the rough proof is gone from the finished picture, and the customer is pleased. That with me is the rule, and am I not justified in adopting that course when the "rough proof" proceeding is so unsatisfactory. The finished proof lessens re-sitting, really saves time, and as time is money, that is why I do it. I cannot charge for a rough proof; for a finished proof I can, and always do.

The "Topic" next week will be "Transparencies by Luminous Paint," by Robert Vincent.

FRENCH CORRESPONDENCE.

ELECTRICITY IN RELATION TO PHOTOGRAPHY.—ABSENCE OF HALOS IN PELLICLES.—ADVANTAGE OF WASHING GELATINE PLATES IN A SOLUTION OF CHROME-ALUM.

Electricity in Relation to Photography.—Being absent from Paris, I have not been able to pay a visit to the electric exhibition which is at present open in that city; I cannot therefore give an account of it as an eye-witness until after my return from the South. I propose then to examine this very interesting exhibition, and to describe in my correspondence any special applications of electricity to photography which I may see there. There are no doubt a large number of applications of electricity to photography which could be contrived, and it is only by studying attentively the exhibition at the Palais de l'Industrie as a whole, that one may be able to hit upon fresh applications of the electric fluid in this novel direction. In my own opinion we ought to be able to find here a rich mine of discovery and new ideas. For instance, it is possible that the sensitive film, exposed to the action of light while it is under the influence of an electric current, may give other results than those produced in the ordinary process. It is possible to conceive a metallic plate covered with a sensitive film, or, still better, a sensitive film, itself a conductor of electricity, which, under the influence of the electric current, will become much more rapid than when not submitted to this action. It is quite impossible to predict the end which may be arrived at in carrying out a series of experiments in this direction. So soon as I am able I shall endeavour to investigate with the greatest care a subject so rich in promise, and I shall be only too glad to give a complete account of my observations.

Absence of Halos in Pellicles.—As I am now taking my annual holiday in the country, my stock of photographic news runs very short, and I am compelled to fall back upon the remarks which I had occasion to make on the subject of my experiments with Mr. Stebbing's pellicle. In the first place, it is necessary to observe that by exposing this pellicle in the slide between two glass plates, we are at liberty to over-expose without running any risk—that is to say, considerably in excess of the limit of the usual exposure with ordinary films. It is true, we lose in rapidity, but we gain the appreciable advantage of having negatives free from the effect of irradiation, which is so disagreeable, and which is especially liable to attack those parts bordering on the high lights. I have succeeded in taking a large number of pellicular negatives without once having to complain of a halo, even at the top of bushes or trees set against a brilliant sky. Notwithstanding the rapidity of the sensitive film, an exposure of ten or fifteen seconds will not cause the sky to encroach upon the trees by means of a white halo, whose effect is so contrary to the truth. This is an important point, though I am quite unable to explain the reason for it. It has been said that if the layer of gelatino-bromide be too thick, irradiation will be produced, and I have in fact seen this effect, and that very markedly, in the plates of Dr. Van Monckhoven; but then plates coated with a very thin film also produced it. We must therefore seek somewhere else for the cause of this phenomenon. Perhaps in the case of sensitive pellicle it is due to the fact that the glass plate in front reflects a portion of the luminous rays, and allows those only to fall on the sensitive surface which emanate directly from the object to be reproduced. To assure ourselves on this point, we might take the same view by exposing the pellicular film, directly making it to adhere to the surface of the glass plate by means of some pitchy substance. Here, where I am away from all my materials, I have not been able to make any experiments in this direction, but I propose to do so as soon as I return to my laboratory in Paris.

Advantage of Washing Gelatine Plates in a Solution of Chrome-Alum.—A bath of chrome-alum to terminate the washing of gelatine plates, after they have been developed and fixed, appears to me to be an excellent means not only of getting rid of the last traces of hyposulphite, but also of giving the gelatine negative great keeping power. I would therefore earnestly recommend all my friends, after they have fixed the negative and washed it in two or three waters, to leave it for two or three minutes in a three per cent. solution of chrome-alum. After taking it out of this bath, it should be washed once more, and it will be found that the plate has been greatly improved by the operation.

Leon Vidal.

HOW TO WORK ECONOMICALLY.

BY R. HUCK.

As the gelatine process requires many dishes, it is as well to know how to make a dish for a few pence, far lighter and handier than earthenware or ebonite, and, if broken, soon mended. Any one with a practical turn can make one in an hour. If you have no means of planing a piece of board, procure at any joiner's shop a piece of thin, dry pine, 2 inches or $2\frac{1}{2}$ inches wide. Ask him to put a groove about a $\frac{1}{4}$ or $\frac{3}{8}$ of an inch from one edge, about $\frac{1}{8}$ deep, on the flat of the piece of pine, the groove to be made with a $\frac{1}{8}$ of an inch iron. Enough should be got for three or four dishes the size you want to make them. Now get a stout piece of glass the size you want your dish to be; square one end of your piece of pine wood, and make a groove in it the thickness of the wood, which will be $\frac{3}{8}$ of an inch. Make your groove $\frac{3}{16}$ of an inch wide, place your glass in the groove made for it, and mark your piece of wood the size of the glass. Finish one end the same as the other with a groove; make another piece the same size in every way for your two side pieces. For the ends cut a shoulder—or a tongue, as a joiner would say—to fit your end groove. Put your two side pieces and the glass together, and you can then cut pieces just to fit between. Screw together with wire screws $1\frac{1}{2}$ inches long; put in dovetailing—that is, put in with slanting points, meeting each other—as they will hold much tighter than if put in straight. Put your glass in with thin putty; varnish with shellac varnish or paraffin. You will then have a dish that will stand a great deal of knocking about, and if the glass gets broken it is very soon replaced.

A strip of glass laid in the bottom of the tray with the end just let into the wood, before putting together, would be very handy for developing. I have had one in use for washing hyposulphite out of prints for the last twelve months, and it answers first-rate. I did not putty the glass in mine, because a leakage does not harm, as it lets the dense hypo water out at the bottom. I used one for developing negatives years ago, and have it by me now. It has been knocked and banged about, and never got broken.

Most photographers have, no doubt, two or three water-tight bath cases by them, through not being able to get glass to fit them. I utilised one last winter by lining it with thin deal grooved together, and then ran pitch into it. I tried Bates's black, but used so much of it that I thought pitch preferable. The worst of it is you cannot get good pitch now-a-days; it used to be a bright looking article, and when broken had a brownish look with it, and when melted it would flow as easily as water. Now you can only get a black-looking stuff done up in 1 lb. and 2 lb. squares in thin wood strips; it will not melt at all well, and as soon as it begins to melt breaks up into bubbles and refuses to run. I shall try this winter one made with pitch dissolved in benzole, and think that will answer as well. The bath I treated last winter I made into a silver bath, and used it up till it got saturated with iodide and spirit; it answered first-rate.

POSING FOR PHOTOGRAPHS.

The Foibles of Presidents, Actors, and more Common Persons.*

A very stout gentleman, more than six feet in height, with a jolly face and a twinkling eye, sat in a capacious hotel-chair, smoking calmly and gazing critically at passers-by. He bowed affably to every third man who passed, occasionally exchanging a word with a friend. A prominent city politician passed, turned his head, glanced at the large gentleman, stopped, and said, "How are you?'

"First rate. How d'ye like them?"

"Immense. Take care of yourself."

"Never fear."

Away went the politician. The large gentleman took a fresh cigar, winked at the writor, and said: "Pleasant."

"So I should judge. Dogs?"

"No. Pictures."

"You don't say!"

"Yes, sir, pictures; photographs of himself that tickled him nearly to death."

"Your'e a photographer, then."

"I'm a positionist. I pose persons, and have done so ever since 1830, when I began to study the rudiments of my art. I have the honour to be the oldest man in the business. It's a special branch, you know, and the whole success of the picture depends upon it. Everything depends on the position in a photograph. I've made pictures of every President, from Andrew Jackson to Garfield, and satisfied them all by the simple but elaborate process of flattery. It must seem rather odd to you that I should have known Van Buren, Harrison, Polk, and Tyler."

"Do you remember their personal traits?"

"Oh, distinctly. In the early days we made Daguerreotypes, but as soon as photography came in, it swept the deck. I made a picture of President Jackson in Philadelphia. Jackson was tall and thin, and had a long face. The Indians called him 'Pointed Arrow,' because he was so straight. He told me all about his duel with Dickinson, way down on the Red River, while he was getting ready to sit. He wanted me to make a profile, but I showed him that his nose was too large, so we gave him a full face and bust.

"Van Buren was a round-headed old gentleman, with a heavy under lip, mild, bright eyes, and side whiskers like Dr. Tanner's. He was a good-natured Dutchman, and allowed me to do exactly as I pleased with him. He took a capital picture. Harrison was tall and very thin. He looked like a galloping consumptive, had big black eyes with plenty of fire in them, a Roman nose, and very large ears. He wanted a profile too, but I explained that his ears were too much of a feature, and he caved. These men all want profile pictures; they think it's more in the order of things. Who knows of a full-face picture of Julius Cæsar? Tyler had a figure like Roscoe Conkling—a big bulging chest and a small waist, with an autocratic carriage of the head. He wanted a profile of his chest, and I didn't want a profile of his face, so I took him side-ways—that is, looking over his shoulder, showing the full face and curved breast. He was tall and thin like all our early Presidents. James K. Polk looked like a villain. He had deep-set, active eyes, long lines beside his mouth, and overhanging brows. His forehead was very fine, but he was rather stumpy. Zach Taylor was a good old man, his manner hearty, and he had such a breezy way with him. He had a big mouth that smiled all over his face, and he wore his hair in every direction. Fillmore was a six-footer, and the first fat President we ever had. He was light in colour, and didn't take well. Pierce looked a good deal like Barney Williams, the actor. Buchanan didn't amount to much—but Lincoln took magnificently. He was a homely man, but had lots of individuality. His pictures flattered him in all but the eyes. They were very fine, what you might call good eyes. I've had fun doing old man Grant. Of all the men I ever met, he is the most positive—that is, his face has no expression. It is always the same. He came into the gallery, one day, all done up nicely, and said: 'I want a profile with bust.'

---

* *New York Sun.*

"'Can't have it.'

"'Then I'll go somewhere else.'

"'All right, General, we'll have to lose you, then, for I'm boss here, and I never give in, unless my opponent is better educated in the art than I am. Are you?'

"Well, he looked at me for a moment, and then sat down and gave in. He is as easy to do as an old stone jug. One morning in '77 a very ordinary man came strolling into the gallery. I had been away for a few days, and didn't know who was coming. I was enjoying my after-breakfast cigar, and not much inclined to work, so I said, 'What do you wish, sir?'

"'I'm here by appointment.'

"'Who are you?'

"'I'm President.'

"'Of what?' He looked so ordinary that he might have been President of a line of jigger cars.

"'I'm President of the United States.'

"'Oh! sit down, please.'

"It was Hayes. He was mighty particular about arranging his cuffs, and insisted on smiling blandly all the time. I knew that his picture would look like that of a western dry goods merchant unless I got rid of the smirk, so I told him a long and affecting story about an alleged child of mine who had caught cold while praying by the open window, and died in my arms the night before. He was afraid to smile then, and I got him right."

"What did you mean by flatter, when you spoke of the ex-Senator who just passed?"

"Why, you don't suppose that photography is accurate, do you? Bless you, no. The camera is much sharper than the eye, and reproduces every mole, freckle, and speck distinctly. We always take the negative and pencil out the spots. Then we make the eyes larger in women's pictures by lowering the under lid, and reducing the mouth by shortening or entirely re-drawing it."

"But this isn't always so."

"Always. A picture is never sent out without being touched up, because it wouldn't give satisfaction. Old maids have to be reduced about ten years on an average. We pencil out every wrinkle and crease, and destroy the sharp outlines of the face to do this. They are awful hard to sit, are old maids; so fussy and opinionated, you know. Lucretia Mott was easy. The Friends are such modest folks, that they want quiet and restful pictures. Victoria Woodhull used to sail in and take possession of the whole business when she wanted a picture. It was no use trying to cross her. The most difficult thing to get, you know, is the individuality of the subject. It is very difficult sometimes, because people come into the gallery all ready to be shot. A man comes in with his face just as he wants it, but not at all like himself. I say: 'What is your business, sir?'

"I'm a shipbuilder."

"'My father died from swallowing a marling-spike.'

"He either looks up in amazement, or laughs, perhaps both; but, at any rate, I break up the cast-iron cast of his features. Last winter I photographed all the bank presidents in the city in an album for the Clearing House. They were difficult, because their faces are old, and they have two expressions—the bank and the home. I also did all the officers on the police force. They are very positive, and take easily. Walling has a magnificent head; but the best-looking man, take him through and through, is Capt. Williams."

"Who takes the best picture?"

"A professional. Actors and actresses can't take bad pictures, because they know just what expression they want, and how they want it. Most people want to smile. I don't mean in a liquid way, though that, too, would be quite true, but they want to be taken full face, with a comprehensive grin. A picture that looks right at you, and smiles, soon gets to be tiresome, while one with an averted face and an ambiguous expression can be studied for ever. I used to have a terrible time with the nose of the elder Booth. It was broken, you know, and I tried to conceal it by taking him at every angle in geometry. I photographed Wilkes Booth, a year before the assassination. He was a poetical man, with beautiful eyes and waving hair. Speaking of beautiful men reminds me that I've an engagement to photograph Roscoe Conkling on his return from Albany. If he gets left on the Senate business, his expression will be worth getting."

"How do animals take?"

"First rate, if they are trained. Poodles are exasperating, though. Babies I love, and to take the portrait of a child is my forte. I make a point of bringing out prominent features. John G. Saxe has a very large nose—which reminds me that all great men have—and when I gave him his photos. he looked at them, then in the glass, and said, with a sigh, that I had given him justice without mercy. I went to see A. T. Stewart once, and asked him if he would sit for me. Said he: 'Are you going to make merchandise of me, sir?'

"'Yes, sir,' said I.

"'Then I won't come.'

"In the old Daguerreotype days I had to take four pictures for an old lady who died two weeks later. The plates were of unusual size, so I washed them and stored them away for future use. About six months later a widower came to be taken. He wanted big plates, so I fished out the old ones, and took him. The plates had not been perfectly cleaned, and when his pictures came out an indistinct face of the old lady was seen over his shoulder. It wasn't his dead wife, but he swore that it was, and believed the whole thing to be the result of Spiritualism. He became an ardent Spiritualist after that, and led the disciples in Herkimer County until his death. Odd, wasn't it?"

"Very."

Correspondence.

PHOTOGRAPHY ON THE MAIN AND TAUBER.

Sir,—The travelling photographer in search of the picturesque would do well occasionally to turn aside from the beaten track to Switzerland, at Mayence, and direct his steps to the banks of the Main and the Tauber. He would find himself in a country full of the most perfect remains of the architecture of the middle ages in Germany, rich in historic associations, and presenting in every town endless quaint subjects for the camera.

Having just finished a happy fortnight with dry plates in this district, I can strongly recommend it. I was not fortunate in weather—I seldom am; but I have exposed all the plates I took with me, and regretted I had not more. To any who may follow in my steps I would say, do not go without a wide-angle lens in addition to the ordinary one, take a few fast plates for exceptional subjects, and choose as tall a stand as you can conveniently carry for work. I found no difficulty in working in the towns, and as I do not attempt to do anything but change my plates when abroad, none at the inns.—Yours, &c.,

Wm. Dillworth Howard.

PORTRAITS ON SEASON TICKETS.

Dear Sir,—I see in your columns that one of the French railway companies require their season-ticket holders to deposit their portraits with the manager of the line. From a photographic point of view, this regulation is, of course, looked upon with favour. I am not a photographer, however, and, for that reason, I may be permitted to point out that there are other advantages from the obvious one that may occur to them.

At the time of the last Paris Exhibition a regulation was in force that all season-ticket holders should have a portrait of themselves pasted on their tickets. I obeyed the regulation, as a matter of course, and for some time afterward thought no more of it.

One day, however, I happened to be in the Palais Royale, and made a purchase that came to more ready money than happened to be in my purse. Would they take a cheque? I asked. Yes, was the reply, if I could establish my identity. I at once produced my passport with name, &c. The shopkeeper was very polite, but my readiness was evidently not re-assuring; there was no proof the passport was mine. I dived into my breast-pocket again and took out the season-ticket, which not only bore my signature, but my portrait. My identification was complete, and my cheque was taken without any further demur.—Yours, faithfully,

F. C. S.

Proceedings of Societies.

Manchester Photographic Society.

An out-door meeting took place on the 10th inst. About fifteen members met at the London Road Station, and proceeded by train to Romiley, thence by road to Chadkirk, where some beautiful views are to be obtained—viz., a picturesque old church, farm houses, big dogs, cottages, foliage studies, and river views in abundance.

The next out-door meeting will be to the lions, &c., at Belle Vue Zoological Gardens, on the 25th. Those who intend to go should at once write to the Hon. Secretary for tickets.

One of the ordinary meetings of this Society took place on the 8th inst. at the Mechanic's Institution, Mr. Alfred Brothers, F.R.A.S., President, in the chair.

The minutes of the last meeting (May) were read and confirmed, after which a few remarks were made on the Society's finances.

Mr. Rishton exhibited a negative which he had intensified by converting the silver into sulphide, as described by him at the last meeting on May 8th, 1881. The negative shown was intensified upon that date, and had been exposed up to the present time to all the daylight possible, under another glass having black-painted bars about an inch wide across it, thus keeping a portion of the negative protected from the light. On examination, no signs of fading could be detected in any part of the negative.

Mr. Brothers exhibited a print from a commercial dry-plate negative, in which markings like wire-net work had put in an appearance. Several ideas were offered as to the cause of the phenomena. He (Mr. Brothers) also exhibited, on account of his friend, Mr. J. B. Holroyd, of Halifax, some negatives taken on Morgan's Argentic Bromide Paper, which were afterwards made semi-transparent, and accompanying the same were prints from each negative. They were considered fairly good results, and, although not quite perfect, certainly a step in a right direction.

Mr. Bleakley exhibited some charming little pictures—instantaneous views of the Isle of Man steamers, and views in and about Douglas. Mr. Bleakley said the negatives were taken on Wratten and Wainwright's instantaneous plates with a 6-in. rapid rectilinear lens, and the exposure made by a drop shutter. The same gentleman also exhibited a very portable non-actinic lamp, a modification of one exhibited a few meetings ago by Mr. Benson, with the four sides made of strips of glass arranged to fold perfectly flat, and to burn oil in an egg cup, or something of the kind.

Mr. W. J. Chadwick showed a washing trough for negatives, and said it originally came from Messrs. Marion and Co.; but he had, he thought, improved it by putting a larger and longer syphon, and taller legs.

In explaining the reason for this alteration, a discussion arose on the subject between Messrs. Atherton, Chadwick, and others.

Mr. John Schofield exhibited two negatives which were taken on commercial dry plates. They showed, upon developing, signs of a previous exposure, or some very peculiar phenomena, which could not be accounted for in any other way.

The Hon. Secretary exhibited, on behalf of Mr. George Smith (the Sciopticon Company), one of his perfect pocket-cameras, with swing back, &c., and also a couple of portable tourist cameras by Mr. Lancaster, of Birmingham. These were objects of much interest to all who sought light and efficient apparatus. Mr. Smith had also sent a few negatives, portraits, and other subjects, taken by a single achromatic view lens, having had very short exposure, thus advocating the more general use of the single achromatic lens. He (the Hon. Sec.) called attention to some alteration in the rules which he thought desirable to make, and after a little discussion on this subject, a committee consisting of Messrs. A. Brothers, A. Coventry, N. Wright, W. G. Coote, and W. J. Chadwick were appointed to draw up the necessary alterations and put the matter in form for passing at the next meeting (the annual). He (the Hon. Secretary) said that several members had been making enquiries from him if a *soirée* could be conveniently arranged, and he thought it was the desire of many—or, perhaps, most—of the members to get up a *soirée* or exhibition of photographs, &c. This subject was, however, postponed until the next meeting.

A vote of thanks was passed to the members who had contributed to the interest of the meeting, and a special vote of thanks to Mr. George Smith and Messrs. Lancaster for their exhibits, after which the members adjourned.

The next meeting will be the annual, at which the voting for officers for the ensuing year will take place.

Thursday Evenings for Photographers.

At the meeting held on the 15th inst., Mr. W. Ashman in the chair,

Mr. Le Fevre gave a short report of the fête given by the Balloon Society of Great Britain at Lillie Bridge Grounds on the previous Saturday. He also gave a description of an invention by Messrs. Jules Goddard and M. de Fonville, for holding balloons stationary by means of electricity, which he thought would be of great advantage to photographers.

Mr. Cobb said he did not think it was necessary for the balloon to be absolutely still to obtain photographs, but it was necessary to have fine weather, and as he had not been favoured with that requisite, he was unable to show any results of Saturday's ascent.

Photographs of the balloon, &c., taken at Saturday's meeting, were shown by Messrs. Rieman, Haddon, Garrat, and Cutchey.

Mr. Henderson passed round a small stand to hold twenty-four C.D.V's., which he had obtained from Messrs. Marion and Co. It consisted of twelve leaves, hinged at the bottom to a light metal frame: this was considered a very useful arrangement for exhibiting specimens in the reception room. He also exhibited a print on paper (in the sensitising of which no silver is supposed to be employed) that had been placed in a gold toning bath, and which, after exposure to light, had become almost black.

Talk in the Studio.

The Photographic Exhibition.—The Exhibition will be held at 5a, Pall Mall East, London, S.W., remaining open daily (Sundays excepted), from Monday, the 10th of October, until Saturday, the 12th of November. All packing cases must be sent sent (carriage paid) addressed to the Photographic Society of Great Britain, care of Mr. James Bourlet, 17, Nassau Street, Middlesex Hospital, London, not later than Friday, Sept. 30th, when pictures by hand will be received up till nine o'clock p.m. Each exhibitor must send a letter of advice (containing a description of each picture, as also a statement of process, and any further detail to be inserted in the catalogue). Each frame or picture may have the exhibitor's name and subject neatly inscribed; but no address, or anything in the shape of an advertisement, will be permitted. No pictures in Oxford frames, and no pictures previously exhibited in London, will be admitted. Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted. Photographic apparatus and appliances may be sent for exhibition. Negatives and transparencies will be admissible. The Hanging Committee will have the power of rejecting any pictures or apparatus forwarded. No charge will be made to members of the Society for exhibiting their pictures; but to non-members, a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings. The charge for wall space to those exhibitors who may become members of the Society at the November meeting will be remitted. Any further information respecting the Exhibition can be obtained from the assistant secretary, Mr. Edwin Cocking, 57, Queen's Road, Peckham, S.E.

On the Velocity of Light.—Mr. Albert A. Michelson writes to *Nature*:—"In view of the experiments of Young and Forbes on the velocity of light, and of the article published by

Lord Rayleigh on the subject, it may not be out of place to state, as a fact which seemed at the time too evident to require special mention in my paper 'On the Velocity of Light,' that if the velocity of red and of blue light in air differed by as much as one-tenth of one per cent., the image of the slit which served as the source of light, instead of being white, would be spread out into a spectrum which could not fail to be observed. The total displacement in these experiments amounted to 133 millimetres; therefore, a difference of velocity of the red and the blue rays of 1·8 per cent. would necessitate a spectrum 2·4 millimetres in length. It is needless to say that no spectrum was observed. These facts appear to be utterly irreconcilable with the conclusion drawn by Messrs. Young and Forbes.

NEW PORTRAIT OF THE PRINCE OF WALES.—We have received a capital cabinet portrait of the Prince, by Mr. W. N. Malby, of Chichester.

PHOTOGRAPHS OF NEW ZEALAND.—Last week we made mention of some Mauritius pictures; this week we have to call attention to a large series of New Zealand photographs, seventy-five in number, which Mr. John J. Taylor has brought home with him. Mr. Taylor has been resident at the Antipodes for some time, and the reminiscences in his possession of New Zealand scenery must afford him considerable pleasure. We hope he may derive profit from them as well.

YELLOW GLASS IN FOG.—A correspondent writes in a contemporary:—"Some years ago I was staying at an hotel on the Lake of Constance. One morning a fog came on which completely obscured the opposite shore, but looking through a strip of yellow glass, which formed the border of the window, I was able, to my surprise, to see it distinctly. I presume the yellow glass choked the blue rays reflected by the fog, just as a Nicol's prism, held at the proper angle, chokes the rays reflected from the glass, and enables us to see clearly the picture behind it. On my way home I stopped in Paris, and, happening to call on one of the principal opticians, mentioned the circumstance to him. He forthwith showed me a naval telescope provided with a cap at the eye end containing a yellow glass, which could be removed at pleasure. I should like to know if the same simple contrivance has ever been used in our own navy.

AN UNWELCOME VISITOR.—On Monday last a cow paid a visit to Mr. Allen, photographer, of St. Dunstan's, Canterbury. Entering the show-room, the animal, still further desirous of satisfying its curiosity, proceeded to the studio, knocking down in its passage across the apartment a quantity of photographic apparatus. Next making its way to the reception-room, where it was confronted by its own reflection in a large mirror, the cow commenced a vigorous onslaught upon it, and butted with such vigour as to threaten speedy destruction to the temporary building. Eventually, however, the partition was broken through, and, with the aid of a cricket bat, the unbidden guest was beaten off the premises.

DETECTION BY A PHOTOGRAPHER.—The man Baudouin, suspected of having stolen the diamonds of the Countesses Branicka and Czacka, on the Northern Railway some weeks ago, has been arrested at Saint Quentin. His capture was due to the astuteness of a photographer who, having taken Baudouin's portrait, was struck by the large amount of jewellery he wore. The police were communicated with, and M. Mace, the Chief of the Detective Department, yesterday proceeded to Saint Quentin, whence Baudouin had written for a further supply of photographs, and succeeded in arresting him. On being taken the thief attempted to escape by jumping into the canal, but the policemen followed in a boat, and finally secured their prisoner. The value of the jewellery stolen was £16,000. —*Daily Telegraph.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER & CARTER, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER & CARTER, *and crossed "Union Bank, Photographic News Co. Account."*

*** A cheque for two guineas will be given for the best "Reception Room Notes—No. 3. Cash at the Time of Sitting: How I get it," to be sent in by the 1st Oct. No name need appear. For rules, see previous numbers of NEWS.

ONE IN A FIX.—1. We have experienced no difficulty when following the directions; but we cannot gather from your letter precisely what you have done. 2. We expect to receive the article shortly.

E. D (Capetown).—The series of "Photographic Handy-Books" issued by our publishers comprises all that you require.

N. M.—If the squeegee is passed fairly over from edge to edge, a piece of glazed paper being interposed to prevent abrasion of the back of the print, all air-bubbles can easily be removed. It is a piece of manipulation requiring a little practice, but is really extremely easy and certain.

J. M. LANGFORD.—It is to be obtained from Messrs. Rouch, of the Strand.

S. T.—See notice in this week's NEWS.

JOHN GREEN.—The copyright covers reproductions on any scale and by any method.

BALA.—Paste together sufficient thicknesses of orange and red paper to form a non-actinic medium; the composite sheet thus formed being 13 inches by 35 inches. Fold this into five, so that each segment is 7 inches by 13. If now the sheet is opened into a square tube, you may stand it over the candle, sufficient air for combustion circulating between those sides which overlap, even though the top be covered. If you do not like to trust to chance for something to put over the top, you may carry a piece of thin tin plate a little over 7 inches square, and turned down at the edges. A lantern of this kind may be made much smaller, but we have found one of the above dimensions to be very convenient, and well suited to cover almost any candlestick.

MABERLY.—1. See leader in our last number. 2. In the case of plates coated as you describe, it would be unadvisable to use a stronger solution. 3. The fixing bath you refer to is used occasionally. A published formula is—

Water	1,000 parts
Hypo	300 ,,
Cyanide	5 ,,

M. EDEN.—The negative is far too thin and weak to be of any use. Try again.

ROBERT.—The paper must be carefully rolled between polished metal plates before use.

JOHN SHAW.—1. Oxide of zinc, known commercially as zinc white, is generally used for the purpose. 2. It is a double sulphate of aluminum and potassium, but in some cases the double sulphate of aluminum and ammonium is sold in the shops instead. It is a matter of indifference which is used for ordinary photographic purposes.

D. W. J.—See leader in the last number but one of the NEWS.

AMATEUR.—There are several manufacturers of the article in America, and probably you may be able to obtain it to order from some photographic material dealer who trades with the United States.

PYROXYLINE.—Try a solution of gum dammar in benzole; say about thirty grains to an ounce.

L. ARDEN.—The camera has evidently been made of unseasoned wood, and now that its parts have become so warped as to refuse to obey the rack-and-pinion, it will be difficult to remedy matters. You might carefully scrape those parts which rub hard against each other, but this will of course cause looseness and ill-fitting elsewhere.

L. CAMMERON.—1. We have more than once met with a similar difficulty ourselves, and although the altered material proved rather intractable at first, it finally yielded to moderately dilute acetic acid—1 part glacial and 4 parts water. 2. No.

LEX.—The effect of light is in reality tolerably energetic in this case; but rapid working can only be realized by making use of an extremely thin film, the colour of the material being so exceeding non-actinic.

CHARLES PORTER.—1. The want of sharpness arises principally from vibration of the camera, and we cannot answer all your questions regarding the quality of the lens unless you send us pictures taken with an apparatus at rest. Forward one taken with full aperture, and another taken with smallest stop. 3. Moderately well. 7. No. 8. Certainly; but we think there must have been reflection from some part of the metal work. 10. Satisfactory.

W. PENN.—You should wash your emulsion in much colder water, and you would then find that no unduly large proportion would be absorbed.

ENGRAVER.—Perchloride of iron answers admirably, equal parts of a saturated solution and water being a convenient strength.

ELECTRIC.—1. A single cell of Daniel's battery will answer very well; but some little experience is required in order to work satisfactorily and economically. 2. A small hand-book is published in Weale's series. 3. We think you might venture to write to the gentleman referred to, as we know him to be most willing to give any information in his power.

J. R. RICHMOND.—1. A close-grained paper is best, and as the composition rests altogether on the surface, absolute chemical purity is of no great importance. We have even seen excellent results obtained by the use of old *Times* newspapers.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1204.—*September* 30, 1881.

CONTENTS.

	PAGE
Making Transparencies by Day and by Night	457
Positive Pictures on Gelatino-Chloride	457
Cameras for Dry-Plate Work	458
The Action of Light on Plants	459
Photography In and Out of the Studio	459
At Home.—Fritz Luckardt at the Hotel National in Vienna	460
Notes	461
Topics of the Day.—Transparencies Produced by Luminous Paint. By Robert Vincent	463
The Reign of Electricity in Paris. From Our Special Correspondent	464
French Portraiture. By W. G. Shaw	465
Past and Present of Making Sun Pictures. By E. T. Whitney	466
A Day's Ride. By George Bradforde	466
Correspondence	467
Proceedings of Societies	468
Talk in the Studio	468
To Correspondents	468

MAKING TRANSPARENCIES BY DAY AND BY NIGHT.

We print a second communication from Mr. Vincent on the subject of employing luminous paint, instead of gas-jet or oil-lamp, for producing transparencies. We can endorse Mr. Vincent's views from observations of our own, and cannot too highly recommend his simple method of working. Some experiments we have made on the subject may be here fittingly recorded.

In the first place, as regards the charging of a surface of luminous paint with light; in our experience, it requires a perceptible time to do this. Working at eleven in the morning on a cloudy day, when the light was much diffused, we found that a luminous-paint surface exposed by the aid of a drop-shutter, and thus acted upon by light for about the tenth part of a second only, was not to be compared, on the score of its luminosity, to a surface exposed for sixty seconds, both being withdrawn from the daylight at the same time. On the other hand, when we—also in diffused light—exposed a surface to daylight for fifty-seven seconds, and put another one by its side during the remaining three seconds of the minute, and then withdrew both together to the dark-room, we found that the luminosity, if not absolutely equal during the first two or three minutes, was certainly equal afterwards. Possibly, in the sunshine, less difference in time would be necessary; but, at any rate, it is clear that daylight does not exert its full action, so to speak, instantaneously, or within a small fraction of a second, but requires some time to work the change on the luminous paint.

But this by the way. Our principal object was to discover how far the luminous paint could be excited by ordinary artificial means. With gas and oil-lamps, we may at once say that our results were negative. Exposure of the paint to a bright flame for six minutes did not endow the surface with sufficient luminosity to yield a transparency with a gelatine plate, even after six minutes' contact. The experiment proved decisively that an oil or gas-flame sufficient to give a transparency in fifteen seconds at the distance of a foot, had no action upon luminous paint of any practical value to the photographer.

Magnesium wire, on the other hand, gives the most satisfactory results. We have made repeated experiments with luminous paint excited by magnesium, and find that the latter is almost equal to daylight in producing a luminous surface for making transparencies. You can judge the exposure so well, among other things. Three or four inches of magnesium wire, which burns for two or three seconds, held in the proximity of the paint, will yield a luminous surface that may be used for making transparencies even half an hour afterwards. If your negatives are already fitted in printing frames with gelatine plates, it is possible to make a dozen exposures with the same luminous surface without trouble. After withdrawal from the light two minutes, an exposure of twenty seconds suffices; after withdrawal a quarter of an hour, forty seconds are necessary.

In these circumstances, there is little doubt that luminous paint excited by a bit of burning magnesium wire affords the best and readiest means of making transparencies in the evening or in winter time. The advantages of uniformity and parallel rays are pointed out by Mr. Vincent, and we have no need to dwell upon the inexpensive character of magnesium wire, which costs but twopence or threepence a yard. As to the luminous paint, we see Mr. Vincent quotes it at 28s. per pound, but lately the price has been reduced, and no doubt sufficient could be obtained for a 15 by 12 surface for, at any rate, not more than a shilling. The paint may be either applied to the back of a glass plate, or to cardboard, and subsequently covered with glass, which protects the surface from moisture and dirt.

In conclusion, we heartily recommend photographers to make a trial of these methods of making transparencies by day and by night. Whether the luminous paint is excited by daylight or magnesium light, it may, albeit its luminosity decreases considerably at first, be employed in the most leisurely fashion any time within half an hour after its withdrawal from the source of illumination.

◆

POSITIVE PICTURES ON GELATINO-CHLORIDE.

Third Article.

It is only necessary to give details respecting the two developers already referred to, the most generally useful of these being that containing ferrous citrate; and when the following directions are carried into practice, a developer is obtained which is well adapted for general use.

A solution of 600 parts of commercial citric acid in 2,000 parts of water is prepared, a gentle heat being employed to dissolve the acid; and the liquid is next neutralized, or rather made very slightly alkaline with ammonia, about 300 parts being required for this purpose. Red litmus-paper should be slowly turned blue by the solution at this stage; but if, by inadvertence, too much ammonia has been added, this excess may be readily removed by heating the liquid until the superfluous ammonia has been driven off. The solution in this condition contains, then, the neutral citrate of ammonium, or this salt with a mere trace of ammonia in excess. The next step is to dissolve 400 parts of citric acid in the solution, and to make up the volume of the liquid to double that of the water first used, about 400 parts of water serving for this purpose. The acid solution of ammonium citrate thus prepared keeps well, and, therefore, a considerable stock of it may be prepared, a trace of mouldiness on the surface being of no importance. The formation of this mould may, however, be prevented by the addition of a few drops of carbolic acid.

The standard solution of ferrous sulphate is next prepared by dissolving one part of the crystallized salt in three parts of water (about one drop of sulphuric acid being added to each four ounces, in order to prevent the deposition of a basic sulphate). It will readily be understood that this solution should be kept in a closely-stoppered bottle, as, when oxidised to a notable extent, it would obviously be unfit for use. The above solutions are mixed, when required, in the following proportions, the small proportion of chloride of sodium being added as a restrainer:—

Ammonium citrate solution	90 vols.
Ferrous sulphate solution	30 ,,
Chloride of sodium solution (1 and 30)...	6 ,,

The operation of development is conducted just as in the case of a gelatino-bromide plate, and the image should acquire the necessary intensity in five or ten minutes. Several plates may be successively developed with the same solution.

As sodium chloride is a very powerful restrainer, care must be taken not to increase the proportion unduly, but at the same time it is interesting to observe that a notable increase in the quantity of this salt present in the developer causes the production of blacker tones than when only a normal proportion is used. Some other soluble chlorides may be employed instead of the sodium compound, but no advantage appears to result; the soluble bromides are, however, much more energetic restrainers than the chlorides.

A large increase in the proportion of the ferrous sulphate solution retards the development, and gives pictures in which the image appears to be more deeply seated in the film than when the ordinary solution is employed; while an increase in the proportion of the ammonium citrate solution has but little effect, excepting to occasion a somewhat darker tint. The effect of diluting the developer is to diminish its activity, and thin images generally result.

The addition of gallic acid to the developer leads to the production of sepia-brown or dark olive-brown tones; the former being obtained when the non-ammoniacal emulsion is used, and the latter in the case of the ammoniacal emulsion. When gallic acid is used, the developer may be made as follows;—

Ammonium citrate solution ...	90 vols.
Ferrous sulphate ,, ...	30 ,,
Sodium chloride (1 and 30) ...	6 ,,
Gallic acid (1 and 10)	10 ,,

The gallic acid developer acts more energetically than the ordinary developing solution, and the exposure may be consequently reduced to the extent of one-third.

The fixing of the pictures is best performed in a tolerably dilute solution of sodium hyposulphite, one part to ten or twenty of water being a convenient strength.

Further details will be given in a concluding article.

CAMERAS FOR DRY-PLATE WORK.

If the history of an institution whose archives are *nil* is necessarily a happy one, we can only say that the history of photography during the last three years must be indeed the reverse. The almost universal ousting of the bath in favour of gelatine in studio work has been the theme of many pens; but there is another result which has followed in its train, which is slowly making itself felt, and which is none the less remarkable. We speak of the great influence it has had and is having in popularising photography, and bringing its enjoyment within the reach of many who either were too lazy to undertake it when wet plates were the only means of reproducing a portrait or a landscape, or who had not the skill or perseverance to conquer the many difficulties attendant on the older method. We have recently been consulted by several gentlemen who, delighted with the results and apparent ease of dry plates, are anxious to commence the study of an art which will enable them to recall at leisure the memories of a happy holiday. The demand for photographic apparatus is now, thanks to gelatine, increasing so rapidly, that most manufacturers are striving to identify themselves with some light form of apparatus specially suitable for tourists. Photography is very much allied to microscopy, but with this difference—that while the latter depends for its success on the absolute accuracy and workmanship of its appliances, the former does not require that refinement of brass and timber that up to a short time ago appeared so indispensable to every photographer's outfit. We have been recently shown a very ingenious camera, the design of Mr. George Smith, in which every possible appliance required in a half-plate camera is confined to the moderate weight of four and a half pounds. This camera was described in a recent issue, and its special features, which are various, were explained.

There are other outfits of the same character advertised in our columns, and to intending amateurs the difficulty appears rather to select from the many than the few. But there is one adjustment that finds a place in every camera which, it has often occurred to us, might be dispensed with in apparatus intended for simple landscape work—we speak of the screw or rack-and-pinion focussing arrangements, which always add considerably to the expense of the camera, require careful workmanship, and not unfrequently get out of order. It has been stated, and quite truly, that, for the purpose of focussing, a quick pitch of screw is much more suitable than a slow. The eye, unable to detect the extremely minute variations in definition which occur when the latter is employed, grasps readily, in the case of the former, the correct position of the focussing screen, and, of course, the advantage of greater rapidity of working is also secured. If this is so, why cannot these refined mechanical appliances be dispensed with in favour of a frame simply sliding backwards or forwards, and secured at the required position by means of a thumbscrew? An arrangement such as this would be perfectly satisfactory, so far as focussing is concerned, and would give a still further advantage in the fact that the frame, being secured at its centre only, would admit of a horizontal swing. The latter, in the case of ordinary landscape work, is of much greater utility than a vertical swing, as it enables us in many classes of subjects to focus partly by means of the swing and by bringing objects at varying distances from the camera into definition, to work with a larger focal aperture. This method of using the horizontal swing back has a corresponding disadvantage, which, of course, must not be overlooked, that the portions of the picture representing objects in the foreground get less exposure in proportion to the distance, than would be the case were the focussing screen parallel to the plane of the lens. The old form of guaranteed light-tight double-dark slide is now, we are thankful to say, being rapidly superseded for dry-plate work by one which does not invariably give a black hinge mark across the developed negative. The form known as the American pattern has solid shutters consisting of several thicknesses of veneer glued together. These draw out entirely when an exposure is made, the aperture being closed by an ingeniously constructed spring flap. They are wonderfully light, weighing, as they do, with plates, about fifteen ounces, and, so far as our experience goes, thoroughly light-light.

For pure landscape work expensive lenses of the rectilinear or symmetrical type are luxuries wholly unnecessary. A single lens of 6½ to 7 inches focus, often costing less than a sovereign, and working with an aperture of $\frac{f}{18}$ to $\frac{f}{25}$, will cover a half-plate with good definition, and with fairly rapid plates the exposure required for an ordinary view should not exceed one to two seconds. Gelatine plates have done much to break down old-fashioned prejudices anent photographic apparatus, and we are glad to see that manufacturers are not unwilling to lend their assistance to the same end.

◆

THE ACTION OF LIGHT ON PLANTS.

Chlorophyll—the green substance which imparts colour to the leaves—plays a very important part in the growth and development of plants. It is now a well-established fact that the extraction of carbonic acid from the atmosphere, and the formation with it under the influence of light of those organic compounds which are indispensable to the growth and health of the plant, are effected by those organs alone that have a green colour. There are no doubt both plants, and parts of plants, which do not contain green colouring material, but these are incapable of assimilating carbon or carbonic acid—that is to say, converting them into a combustible or oxydisable substance; they are like animals compelled to subsist on the products of green vegetable matter. As a necessary consequence it follows that the first organisms which made their appearance on the earth's surface must have been plant cells containing chlorphyll; all higher development of organic life depends on this fact.

Hitherto our knowledge of the manner in which chlorophyll acts in collecting and assimilating carbon in the plant cell under the action of light has not been very clear. Recently Professor Pringsheim, the botanist, has published the results of his investigation on this point extending over several years. He shows that a chlorophyll corpuscle contains, besides the green colouring matter, an important, but as yet unknown, substance, to which he has given the name of hypochlorin, and he believes that this is a product obtained from carbonic acid by means of chrophyll with the co-operation of light. Both chlorophyll and hypochlorin are formed under the action of light, and when plants germinate in the dark, neither the one substance nor the other will be developed. Such plants acquire a green colour only after having been exposed for some time to the light, and no traces of hypochlorin can be detected until after the formation of chlorophyll.*

Light calls into play two different, and in some respects opposing processes—first, the reduction of carbonic acid from the atmosphere and the formation of organic substances, such as hypochlorin and starch, which are rich in carbon; secondly, but in a less degree, an oxidation or combustion or respiratory process. From the fact that the first of these processes is more active than the second, the growth of the plant becomes possible.

Respiration in the plant cell is more especially promoted by violet or blue light; if there were no chlorophyll, the rays of these colours would penetrate with unabated force into the interior of the plant, and would produce the oxidation of the hypochlorin to too great an extent; but since the chlorophyll absorbs the blue and violet rays, it acts as a kind of screen, and, owing to this protection, the plant is able to generate those substances which are necessary to its existence and its growth.

A very intense light decomposes both chlorophyll and hpyochlorin. Professor Pringsheim concentrated sunlight on various plants by means of a lens, and interposed transparent screens of different colours. He found the decomposition in blue light to be much more rapid than that in red light. It follows that the phenomena are not produced by the heat of the sun's rays, but that they are caused by a peculiar property of light.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

The Forthcoming Exhibition—Sending Out Proofs—Photography and the Patent Laws—Photography in a County Court.

The Forthcoming Exhibition.—We suppose that out of the two hundred or so of exhibitors at the annual exhibition at Pall Mall, not more than a tenth are really satisfied with the way the pictures are hung. Each one, of course, wants the best place, and as no two opinions exactly coincide as to what the best place is, the difficulty of satisfying everybody is somewhat formidable. It is rather a remarkable thing that the exhibitors who are most discontented are those who, with a morbid dislike to anything like conventionality, seek to make a sensation by something novel in the way of frames and mounting. A man goes in for pictures of portentous size, and, not contented with exhibiting one, swamps the hanging committee with half-a-dozen or more; or he insists upon adopting proportions of such awkwardness that by no exercise of ingenuity can the frames be made to fit in with any other; or he elects to mount his photographs in a fashion which stands out prominently wherever his work may be placed, and invariably destroys the effect of all the surrounding pictures; or—and perhaps this happens more frequently than anything else—he is so late in sending in his contributions, that they have to be hung in any odd corner which may happen to be vacant. All these eccentricities, to give them a mild term, are very harrassing to the committee who are entrusted with the difficult and delicate task of hanging, and we hope that this year exhibitors who have once erred on these points have gained experience, or, if they are dissatisfied, to consider whether, after all, they themselves have not been more to blame than the hanging committee. The exigencies of space are very trying, and it is a melancholy fact when a picture which deserves a good position is obliged to be relegated to obscurity simply because its frame won't fit. *Verb. sap.*

Sending Out Proofs.—It is satisfactory to see that the two writers on "Sending out Proofs" in last week's News agreed thoroughly on one point—the wisdom of sending out finished pictures in preference to rough proofs. Many photographers prefer to send out rough proofs, on the ground that sitters have a knack of not considering the specimen as something to be paid for, and therefore, to make the photograph valueless, they are sent out untoned and unmounted. This, however, is a great mistake, and as both Mrs. Way and Mr. Beeby pointed out, leads to more trouble and dissatisfaction than anything else in the whole practice of photography. First impressions are literally everything in regard to the sitter, and if there is a latent feeling in his or her mind that a re-sitting would produce a better result, this latent feeling is bound to show itself in some way disagreeable to the photographer. It is the case, however, that with finished proofs some people are unreasonable enough to fancy they do not belong to the order of half-a-dozen or a dozen, as the case may be; they regard the "proofs" as, in fact, "thrown in." Care, consequently, should be taken to ensure no mistake on this point.

Photography and Patent Laws.—Patents connected with photography are not of that rarity to make the Patent Bill promoted by the Society of Arts a subject of no particular interest to photographers. At the British Association Sir F. Bramwell read a paper on the subject, which, embodying, as it did, the principal points of the Society of Arts Bill, is worthy of a passing notice. It is a very common thing, he said, for a patentee—properly speaking, a would-be patentee—to obtain provisional protection, and, having done so—either through being too much occupied with other matters, or through being incompetent to develop his own ideas—to abandon further proceedings with his application; and to allow the provisional protection to lapse, and thereupon the provisional specification is made public. Something between 30 and 40 per cent. of the applications made for patents do not go beyond that stage, and, to obviate this, the Committee propose that the provisional specification should be a merely temporary document, and that it should never be public; so that, whether a patent be granted, or whether the provisional protection be suffered to lapse, the document would be destroyed. On this point, however, differences of opinion exist. When a man obtains a provisional specification, to enable him to describe certain rough ideas concerning his invention, it is granted to him on the understanding that within six months he would file a complete specification. If, then, the invention is of so much importance that the inventor desires to protect it at the earliest moment, and secure a few months of protection for working it out, it is scarcely pertinent to say that "he has been too much occupied with other matters" to carry it out, though it is possible that he may be "incompetent to develop his own idea," or (which is not unfrequently the case) may lack the necessary funds to procure the "seal." The obvious answer to his excuses is, that he should not have been in so much hurry to obtain his provisional specification. It is held, therefore, by some that it would be better to have no provisional specification at all, but rather to allow a patent to be granted at once at a reduced cost for stamps, and to allow power for amendment and disclaimer. Another important project of the Bill is, that a patent should not be rendered invalid by any dormant publication of the main ideas—such, for instance, as a book in the British Museum. They propose that, unless an invention can be shown to have been in use within thirty years, no mere publication, unaccompanied by use, should be considered to be an anticipation of a patent. With this proposal must be coupled another, which has long been a point of animated discussion; viz., the compulsory utilization of a patent, either by the patentee or his licenecces, under pain of abrogation of his rights. The Bill contains other points; but these are the most important, and, no doubt, will lead to much discussion during the winter season. It should be mentioned that, since the Society of Arts initiated their Bill, the Government has intimated its intention of taking up the subject; but it is evident that the discussions on the Society of Arts Bill will naturally influence the framing of the Government measure.

---

* The conifers form a remarkable exception to this rule, since in them both chlorophyll and hypochlorin are formed apart from the luminous influence.

Photography in the County Court.—Photographers who paint portraits on approval should be certain there is no misunderstanding as to the terms of the contract, or they may be landed in some awkward litigation. This appears to have been the case with a Bath photographer, who executed two portraits from photographs of a gentleman and his wife, and who subsequently had to summon the sitters for the money. As is very often the case, the swearing on either side was extremely hard and diametrically opposite, the plaintiff contending that the paintings had been definitely ordered and accepted, and that both defendants had expressed themselves pleased, while the defendants, on the contrary, declared that they had never accepted the portraits as good likenesses, a letter being written requesting the photographer to "come and take the daubs away, or they would be exposed in the interests of society." The termination of the case was not a little singular, and, if faithfully reported in the local paper, not a little confusing. After hearing the evidence, the judge handed to the jury these four questions in writing:—1. Do the jury believe that the agreement was that the portraits were to be painted for £8 from photographs? 2. Whether the two portraits were painted subject to approval? 3. If so, whether the portraits were reasonably like the photographs? 4. Was twelve months' credit a part of the agreement? The jury retired for about ten minutes, and then returned with the word "Yes" written in answer to each question, adding, "We consider the pictures ought to have met with the defendant's approval." Now here comes the odd part, and this we take verbatim from the "Sherborne and Dorchester Journal," in which a report of the case appeared:—"His Honour said the verdict was for the defendant. The action was brought too soon, and the jury thought the pictures ought to have met with plaintiff's approval. As they did not, the verdict was for defendant. The jury then left the court, but returned in a few minutes to say that their verdict had been misapprehended. They considered the portraits were good enough to meet with defendant's approval, and he ought to have been satisfied with them. His Honour: 'Oh! I see, I misconstrued the sentence. You mean defendant ought to approve of the pictures.' A juryman: 'Yes, we think that twelve months' credit was given, but that the plaintiff is entitled to his claim.' Mr. Watts, the counsel for the plaintiff, then said the twelve months had expired, and asked if the costs might stand over until the next court, a request which was granted, in spite of the opposition of defendant's counsel." Now, what we should like to know is: was the verdict for defendant or for plaintiff? If it was for the former, it was certainly against the opinions of the jury; if it was for the latter, what was the meaning of the application respecting costs? In the interests of the profession we should really like a little light thrown on this mysterious action.

At Home.

FRITZ LUCKARDT AT THE HOTEL NATIONAL IN VIENNA.

"Under no circumstances whatever can portraits of little children be taken!" So reads a significant notice in the reception-room, which makes many a visitor stare; it is one of the first subjects, too, on which we speak, when Herr Luckardt kindly bids us welcome. "You see, I am not a baby's photographer," says our smiling host. "It requires a good deal of natural tact to deal with children, and I frankly confess I have not the proper attributes. The children's photographer must possess an even temperament and a contented mind; nor must he be put out if the child gets eight toes to its feet instead of five."

If we were asked with whom of all our English photographers we should compare Herr Fritz Luckardt, our answer at once would be, Mr. H. P. Robinson, of Tunbridge Wells. There is a spirit of independence, and a straightforward way of speaking and acting, very characteristic in both gentlemen. We spoke of Herr Luckardt to several friends in Vienna and Berlin, and the comment invariably was, "Ah! when I have such a good name, and so firmly established a reputation, as Herr Fritz Luckardt, then will I, too, be independent." But there is something more than independence that makes up our friend's character; it is the independence of a thorough artist, the strong will of a man who knows he is right, the firm assertion of a master who is confident of his powers. At the same time, there never was one more cognisant of his weakness, and the shortcomings of his art. He knows when success will reward him, and when his labours, try as he will, must necessarily fail. The perfect rendering of drapery in Fritz Luckardt's studio is proverbial; the delicate folds of robe or mantle, right to the very margin of the plate, the exquisite shades that play upon the fabric, the fineness of detail, while yet softness and harmony prevail, are all subjects for wonder; and yet Herr Luckardt never dictates as to the tint or style of his sitters' dresses. "I take my sitters as they come. If they consult me as to dress, I tell them to wear what they like best."

With all our host's success in portraiture, he is not always contented. "Sometimes a lady appears in the studio, and, before I have well time to say good morning, she begins with, 'Oh! Herr Luckardt, I have been taken by Smith, and Brown, and Jones several times; and now I come to you to give me a proper picture.' Well, if I am in a good humour, I say, I will do what I can, madam, of course; but it seems to me, if all these gentlemen have tried their best and failed, that the fault is not theirs, but your own."

Herr Luckardt's studio is a low-roofed one. It strikes the visitor at once as a broad and shallow apartment. On the light side there is a three-feet skirting-board; then, perhaps, seven feet of glass. The glass roof slopes but slightly, and, as its width is probably eighteen feet, the glass room naturally strikes one as being very low indeed. The entire length of the studio is about twenty-seven feet, of which seventeen is glass. This glass portion of the roof is surmounted along the edge (outside the studio, of course) by an upright metal screen, six feet high, which serves the excellent purpose of keeping the direct rays of the sun from entering through the roof (fig. 1).

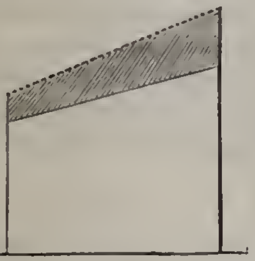


Fig. 1.

This sun screen permits the photographer to work with but few curtains, and to employ top-light without fear of the sun. Indeed, in Herr Luckardt's studio, most of the work is done by light that comes through the roof. There are curtains everywhere; but use is rarely made of them, the metal shield answers its purpose so well. "Employ as few screens as possible," says our host; and there is no need for them, since the light is not direct. So little account does Herr Luckardt take of his side-light, that the panes are, many of them, covered with dark calico, while others are screened with transparent tracing-cloth. The tracing-cloth is below, and the more opaque calico above, so that a low shadow may be cast if necessary.

"I put my model here," says Herr Luckardt, placing a chair not more than six feet from the light side of the studio. "Then, as a rule, I move my camera a little to this side or that, until the lighting and pose appear most favourable. It is so much easier to move the camera than the sitter." To secure light or shadow about the dress of the model, a movable screen but five feet high is employed, fitted with both light and dark fabric, like dark and light blinds that are made to pull up and down. You may pull the dark blind down over the light one, and so have a dark screen; or you may have only a light one to reflect the lower part of the dress; or, again, you may have the screen parti-coloured—the lower part light and the higher part dark, or *vice versa*. A method of constructing such a screen will suggest itself to most people, and its value is evidenced by the exquisite lights and shadows to be seen in the drapery of Fritz Luckardt's models.

The shadow side of the studio is too far away from camera and sitter to exert any great influence, and is covered with paintings and works of art likely to interest the sitter. Herr Luckardt has also a good method of attracting the sitter's attention during exposure, consisting of a little clock-work apparatus, with a carte-de-visite opening. The sitter looks at the opening, and is interested to see portrait after portrait come into view ("they are all of Vienna celebrities," says Herr Luckardt); in this way an animated expression is secured, without any strain upon the sitter. There is so much light in his low-roofed studio, and so little of it is cut off by curtains (thanks to the sun screen outside), that exposures are comparatively quick, and Herr Luckardt has found no use for gelatine plates. "I always take plenty of time over each sitter, you know; although one of these days my mode of working may alter," observes our host, laughing, "and I shall have to take portraits at express speed; gelatine plates will then be very handy. My assistant will cry out sharply over the bannister, 'No. 45 now sitting; please send up Nos. 46 and 47.'"

Herr Luckardt not only poses and arranges every sitter, but does much of the technical work besides. More than this; what he himself cannot do, he does not leave in unskilled hands. His chief assistant is, perhaps, only second to himself in ability and artistic capacity, and it says something for Herr Luckardt, as a principal, that his first lieutenant has remained with him for many years. Talented assistants are not so rife that one can afford to part with them, and Herr Luckardt is evidently wise enough to know when he is well served. Only silver printing is resorted to in the Luckardt establishment; indeed, carbon printing, if not unknown, seems to have scarcely a disciple in Vienna.

Herr Luckardt is very complimentary towards English sitters. They are of a quieter disposition, he says, and are more obedient and plastic. "Unfortunately, in your English faces, the front teeth are apt to be prominent, and one has sometimes to choose between an animated face, with the mouth open, and a glum expression, in which the teeth are not shown. Directly I ask my English sitter to close his lips, his brightness vanishes." Many of our readers will be able to bear out what Herr Luckardt says, but it is only, of course, when the British face is contrasted with those of other nationalities that the character is most apparent.

Herr Luckardt would like to say something about the glazing of studios before we go, and hopes that a plan he has advocated for some time past may ere long be universally adopted. The inconvenience of a leaky glass roof is too well known to require that any stress be laid upon it, and it is Herr Luckardt's opinion that if glass plates were only made of rhomboid form, and so laid one over another towards the top of the roof, there would be no longer any complaint of leakage from rain. The raindrops would run always towards the lowest angle of the glass, and in this way be carried off from one pane to another until the water reached the ridge of the roof (fig. 2).

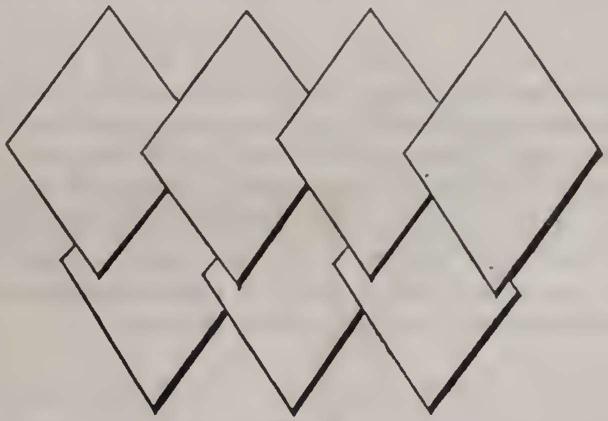


Fig. 2.

Herr Luckardt is going to turn his attention during the winter to this subject more fully, and we may expect an important paper on studios to be read by the Hon. Secretary of the Vienna Photographic Society, an appointment which the renowned Austrian photographer worthily fills.

The "By-the-Bye" next week will be "On Business Tact"; the following "At Home" will be "Herr Prümm, Unter den Linden, Berlin."

Notes.

"Silver Printing," by Mr. H. P. Robinson and Captain Abney, R.E., F.R.S., is published to-day.

The latest "corner" announced from America has to do with the late General Garfield's portrait, the prices of which increased one hundred per cent. on the day of his death.

The Photographic Exhibition at 5, Pall Mall, East, opens with a Soirée on Saturday, the 8th prox., at 8 p.m.

A correspondent points out that a mixture of beer and soluble silicate, eleven parts of the former to one of the latter, which is recommended as a substratum for collotype plates, jellifies in a very short time. Since Graham has affirmed that a trace of carbonic acid will gelatinise silicate of potash or soda, no doubt it is the presence of this body in beer that brings about the change described. The mixture, if used, therefore, as a substratum, must needs be employed very quickly.

Mr. W. H. Deering, F.C.S., suggests that possibly Graham's dialysed silica, which is free from salts, and which may be regarded as *mineral albumen*, could be employed for a substratum. A dilute solution applied to a glass surface could be coagulated like albumen, at will. A trace of alkaline carbonate—say carbonate of soda or potash—brings about this coagulation, as does also a moderate heat.

Another interesting property of dialysed silica solution is that it gives a gelatinous precipitate with gelatine solution.

According to Graham, this "mineral albumen," is easily prepared. A dilute solution of silicate of soda or potash is poured into a large excess of hydrochloric acid, when the silica dissolves. The liquid is then put into a dialyser—an apparatus like a small tambourine, with a parchment bottom—and this latter stood in cold water for a few days. The salts pass through the parchment bottom into the water, which is changed every day, and the dialysed silica is obtained without further trouble. Testing the silica for common salt, which by rights should all pass through the parchment, may be done, as every photographer knows, by means of a few drops of nitrate of silver solution, which produces turbidity so long as salt is present.

Photographers should remember that if silica makes an adherent substratum, it attacks the surface of the glass. This does not matter in collotype work, but in the case of old gelatine plates the glass is well-nigh useless. To show the tenacity of a film of silicate, it is no unusual thing for a chemist to find beaker or dish upon his laboratory table fractured by a film of silica left at the bottom of the vessel.

The velvet roller still holds its own in the photo-lithographic establishment at Woolwich. Blue bank post paper is coated once with a solution of bichromated gelatine, dried, and printed under a line negative. The print is soaked in water, then taken out and stretched over a glass plate, the ends being tucked under the glass, and in this state is ready for rolling up with the velvet roller; transfer ink about the consistence of butter is used with the roller, and after ten minutes' manipulation a most delicate transfer is at hand, that any ordinary lithographer can deal with.

The *Inflexible*, the premier battle-ship in the navy, being the most heavily armed and armoured of our iron-clads, has been lit up between decks by Mr. Swan's lamps. For the first time the officers and crew of a man-of-war will move about in a well-lighted space, and the dull, gloomy cabins will give place to brilliantly illuminated little rooms. The *Inflexible* makes her first voyage next month.

Mem. in developing.—Rinsing out the developing dish before using it again is not always sufficient to remove deposits, which frequently cling to bottom and sides with remarkable tenacity. A sponge kept specially for the purpose, or a clean rag, should always be used prior to the last rinsing.

Mr. Frederick York entertained the members of the Photographic Club last week with a lantern display of an original character. The slides, all of which were true photographs, illustrated various popular stories, to wit: "Little Nell," "A Trap to Catch a Sunbeam," &c. Various scenes, or tableaux, had been enacted by real personages, and these scenes photographed. Thus we had photographs of facts illustrating fiction.

Some of the groups and scenes were excellently arranged. A drunken character, turned out of a public house with the attendant policeman, potman, and hangers-on, made up a most realistic picture. Codlin and Short among the tombstones with Nell and her grandfather was another effective slide; and so genuine sometimes was the photograph, that it awakened a touch of pathos which a painted slide, however well executed, fails to call forth. The only defect was in the failure to depict Nell's sweet comely face; but to do this adequately is probably outside the realms of possibility.

The Science and Medical Schools begin work again on Saturday. We see that Professor Frankland is succeeded as Professor of Chemistry at South Kensington by Dr. Roscoe, a name well-known to photographers by reason of his researches on light, and other photographic work. Teaching is not generally considered a lucrative calling, but the late occupier of the chemical chair at Kensington is credited with having enjoyed fees and emoluments to the extent of £3,000 per annum.

A shallow cup-shaped evaporating dish of porcelain, and a large iron saucepan with its well-fitting lid, are very handy utensils in the preparation of emulsion when very large quantities are not required. For instance, the ordinary evaporating dish, measuring seven inches inside, will contain eight ounces of emulsion, and float with safety, while a dish of eight inches and a-half inside measurement will float with sixteen ounces. To maintain at a warm temperature, the evaporating dish is set floating in a saucepan of hot water, and, with the cover on, there is no chance of light entering. The temperature will depreciate but little in half-an-hour in a warm room, especially if covered with cloths or old blanket.

Eder and Toth's plan of increasing the sensitiveness of bromo-gelatine plates by bathing them in a solution of citric acid and silver is certainly very practical. The solution is made up of :—

Citric acid	10	parts
Nitrate of silver	10	,,
Water	100	,,

To this mixture are added from 100 to 200 parts of alcohol. The sensitiveness is at least doubled by the operation.

When the gelatino-bromide has not been carefully washed, a weak bath of this nature does not have much effect, because the soluble bromide contained in the plates renders the nitrate of silver inactive ; but in this case it is only necessary to add twice as much silver nitrate to the alcohol, in order to produce the desired effect.

"I say, George, just put some oxalate of potash into that bottle, and make a saturated solution." "All right!" said George, but, for the life of him, couldn't understand how a *solution* could be anything else than saturated.

Soaking and saturated with rain he had often enough been lately. I was saturated thought he, and not the rain. "A saturated *solution*, indeed ; it is the potash that will be saturated," and George does not yet see the solution.

Topics of the Day.

TRANSPARENCIES PRODUCED BY LUMINOUS PAINT.

BY ROBERT VINCENT.

In May last* I forwarded a brief account of a plan that I had employed for some time past for producing transparencies. The method is at once so simple and satisfactory that I do not hesitate again to call attention to it, and to recommend it particularly for making transparencies of large dimensions.

To give some idea of the sensitiveness of the gelatine plates that I employ, I may mention that an ordinary fish-tail burner at six feet distance will produce an excellent transparency in ten seconds, or, if the negative be dense, then fifteen seconds are required. In these circumstances, it may be asked, why resort to any other means of illumination ?—there is nothing more handy than a gas jet, or less costly ; while if the flame varies a little with the pressure, the difference in practice is scarcely observable.

I will try to explain the advantage of luminous paint over a gas-burner in the production of transparencies. In the first place, there are few dark rooms in which a suitable jet is to be found, or, if a suitable jet exists, it is not always in a convenient position for making exposures. Again, besides the vitiated atmosphere that results when a number of exposures are made in a close room, with the gas burning some time, there is the inconvenience of turning the light on and off continually during the operation ; with a luminous paint screen, on the other hand, no clear intervening space of several feet is required, and its employment does not necessitate increased ventilation.

But the advantage of luminous paint for transparencies is best seen when large negatives have to be copied. I have an "Aladdin's lamp," which I purchased of Ihlee and Horne, of Aldermanbury, and for which I paid eight or ten shillings—I forget exactly. This is nothing more than a big surface of luminous paint, framed and glazed. With it I can produce transparencies up to 15 by 12. To do this with a gas-jet is of course quite possible, if you are at a considerable distance, but it is ten chances to one the whole surface of the negative is not uniformly impressed with the rays, which, under any circumstances, are not parallel. In the case of the luminous paint-screen, however, it is merely necessary to clap the printing-frame (containing the negative and the gelatine plate) face downwards upon the "Aladdin's lamp," which has been previously exposed to daylight, and in a few seconds the exposure is complete.

It is a mistake to suppose that the exposure must needs take place the instant the "Aladdin's lamp" is removed from the daylight. If you use the "lamp" fresh, the chances are you will over-expose. Employed within one minute of its withdrawal from light—I am speaking of ordinary diffused daylight—an exposure of one second will often be too much—taking such plates of the sensitiveness I have mentioned, and the normal oxalate development (Dr. Eder's formula), which, for transparencies, at any rate, I much prefer to pyrogallic development. On the other hand, if, instead of using the Aladdin's lamp immediately, you wait five, ten, fifteen minutes, after withdrawal from daylight, you will find the light much more under control. I have made a dozen transparencies without re-exposure of the "lamp" to daylight. I find that, with my lamp, an exposure of three or four seconds is required after five minutes' withdrawal, an exposure of fifteen seconds after ten minutes, and an exposure of twenty-five seconds after fifteen minutes—this with a negative of normal density. The delicate detail in the shadows so soon gets lost that over-exposure should always be avoided if you want a bright and vigorous transparency.

If your dark-room is not well lit, as soon as you have poured over your developer, you may turn the "Aladdin's lamp" round and use its light to develop by ; I have never found any ill effects from its light, if only the development has begun before the "lamp" is made use of.

It is only since I have taken to the production of large transparencies that I purchased an "Aladdin's lamp." For many months I used nothing but a piece of cardboard, coated myself, simply with the luminous paint, and protected from dirt by a piece of glass. This answers admirably for whole plates or any smaller pictures, and those who can obtain a small amount of the paint can perfect for themselves an "Aladdin's lamp" up to any size. The paint, when I enquired the price, was 28s. a pound, but a tiny sample I obtained was quite sufficient for the making of my first screen. I do not think there can be half-an-ounce of paint on the 15 by 12 "Aladdin's lamp" that I have, and therefore, if photographers could only purchase it in small quantities, the cost of a screen would be but nominal. Some of our apparatus dealers would find it worth their while to sell the paint retail, I should think, for any photographer who tries this plan of printing cannot fail to be satisfied with it.

To sum up the advantages of the "Aladdin's lamp" for making transparencies I would say :

The exposure can be more accurately timed than with a gas jet.

The rays being parallel, the transparency is more likely to be uniform in depth and tone.

There is no necessity for a space of several feet to intervene between the source of light and the frame ; and finally, the "Aladdin's lamp" is not only more convenient and handy to use, but it does not, like a gas-flame, add further to the vitiation of the dark room.

The "Topic" next week will be "Wanted, an Operator," by Cliff.

---

* See PHOTOGRAPHIC NEWS, page 230.

THE REIGN OF ELECTRICITY IN PARIS.

FROM OUR SPECIAL CORRESPONDENT.

A well-known writer has aptly described the Parisians as "quick in revolution," and this view of their character seems to be true in several ways. Every one appears to are regard electricity as the ruling spirit of the immediate future, and so much is this the case, that the *flâneur* on the Boulevards vivaciously tells his companions how balloons may now be guided or controlled, omnibuses propelled, and the light of the sun itself surpassed, all by this adorable force, of which an unlimited quantity may be stored, all in a little toy of a box like this—showing his silver snuff-box. We hear, however, views which are somewhat more scientifically accurate, discussed in the students' restaurants of the Quartier Latin; Ohm's law and the ring armature being brought under review almost as naturally as the graces of Lisette or the perfidy of Tulipia.

Even the *gamin* of the streets has been touched by the universal influence, I having just noticed, while passing along the Rue des Ecoles, two of these bare-headed and blue-bloused youngsters reverently regarding a dilapidated telegraph instrument, which stood on a stall among odds and ends, and was ticketed, "*Instrument Electrique, 5 francs.*" Passing round into the Rue St. Audré des Arts, and seeing a notice about electric photography, pictures delivered immediately, half a franc and upwards, I entered and was taken, but failed to trace the *rôle* of electricity in the process. The photographer, when interrogated, told me that there there was an electrical apparatus of his own invention inside the camera, and it made the pictures very, very much finer. Would he let me see it? Impossible, as he was going to apply for a patent—but look at the result! *Pilules Electrique* and "*Cirage Electrique*" are both to be purchased in the French capital at the present time, the former being so effectual medicinally, that a tenpenny box will radically cure any one disease out of a list of near fifty; while the latter serves to render the operation of boot-cleaning a real pleasure and delight.

A visit to the Exhibition in the morning is a trifle disappointing, as comparatively few machines are in action, many exhibits are without attendants, and a general dullness prevails. In the evening, however, all is changed; the mixed nature of the crowd waiting for the door to open at eight o'clock testifies to the universal interest taken in the new force. The Parisian *savant*, or professional scientific man, is hardly so starched and stiff as his English brother, and we hear him explaining to a group of three or four needle-women how thirty or forty sewing machines (in the exhibition) are actuated by one small battery, which may be placed in a cellar or other out-of-the-way place, the thumb and forefinger of his right hand serving to represent the permanent magnet of a Deprez motor, while his pocket-knife takes the place of the revolving armature. The magnificent bronze chandelier bearing Siemens' lamps, which lights the vestibule, sheds a soft clear light on electrotype statues and works of art which in some cases must be over a ton in weight, while the revolving lantern of the lighthouse shoots an occasional bright beam across the scene, gilding the edges of the statues, and eclipsing for the instant the lights of the chandelier. The entry into the grand hall is a matter to be remembered, and is calculated to awaken the deepest emotion in the mind of one who has carefully followed the developments of electricity during the last twenty-five years. That light which has been almost worshipped in the laboratory, and often sworn at in the lecture room on account of its persistent tendency to go out just as wanted, is shining steadily and brightly from a thousand points at the same time, making day, or more than day, of the shades of night. In vain I looked for a gas jet, or even for a candle, thinking that the old light would surely be used for lighting out-of-the-way corners. Not so, however; even a man who was examining the inside of a boiler used a couple of incandescent lamps attached to the end of a stick.

The Brush Company, the Gramme Company, and Siemens Brothers are to the fore as regards powerful lights—indeed, I am afraid to say how many standard candles the great light of the Brush Company is equal to, carbons of about two inches in diameter being employed; while, as regards the minor incandescent lights suitable for domestic use, the Swan lamp seems likely to take the first place, but closely followed by the Lane-Fox, and Edison systems. Speaking of Edison, one may remark that the two spacious apartments allotted to this indefatigable inventor form an electrical exhibition in themselves. All round and about the room are arranged his incandescent lamps ready to be lighted by half a turn of a stopcock-like button, and others ready to be extinguished by the same means. One of his numerous assistants touches a button, and we are left in darkness, the noise of machinery ceasing at the same time, while another touch recalls all the previous light and motion. Edison proposes to furnish this light and motive power to every household, thus bringing coffee mills, sewing machines, pumps, bellows, and other household machinery under the domain of electricity. Here is the phonograph—the quadruplex telegraph—by means of which four messages can be sent through a single wire at the same time; the loud speaking telephone which can be clearly heard through the hum and rattle of the machinery; and Edison's improved autographic telegraph, by which hand-writing may be rapidly transmitted through the agency of the electric wire.

Close to the entry of the Edison rooms is a very fine exhibit of photo-reliefs, by Messrs. Moses and Guimaraes, reproduced by the electrotype process, medallion portraits eight or ten inches high being shown. These appear to be partly the result of hand work (beating up), although the base is undoubtedly photographic, and the general effect is very good. Photo-heliography is fairly represented; J. Tostrup, of Christiania, showing some excellent plates about 24 by 18 inches, while P. Petersen, of the same city, shows still larger specimens of work in this direction, one plate being over three feet long. The Royal Millitary Institute of Florence contributes a very fine collection of eight large cartographic plates and two line engravings, the work being admirable; but, unfortunately, they are placed so high up that one is obliged to obtain a pair of steps to examine them. Two plates, also map work, produced by the Russian topographic commission, are worthy of notice, on account of the perfection and solidity of the fine lines. Some interesting specimens of photo-engraving by Scamoni are also to be seen.

The Municipality of Paris makes considerable use of photography in connection with every-day work, and two apparatus for the enlargement of micro-photographs by means of the electric light are shown—one of these being vertical, and including an ordinary microscope, while the other is horizontal, and forms a much more perfect instrument. It is worthy of note that the city authorities have recently caused a number of photo-vitrified reproductions of old engravings to be prepared and mounted as window transparencies. One very fine series, placed within the last few weeks in the Hotel Carnavalet (the permanent municipal museum), includes the Pont St. Michel, Pont au Change, Hotel de Ville, Tour de Nesles, Porte de la Conférence, Cimitière des Innocents, Notre Dame, Port St. Honoré, Port St. Bernard, Port St. Antoine, and Cour des Comptes. Several portraits of municipal celebrities are to be found in the collection, and it is supplemented by a very extensive series of photographs after nature, these being mounted in hinged frames for convenient reference.

The electric-light studio of Liébert, which is to be found in one of the galleries of the Electrical Exhibition, does not appear to be so much patronized as one would expect. Possibly, the Parisians conclude that daylight is more economical, effectual, and convenient for portraiture than the electric light; and possibly they may be right. The arrangements, as regards the light, are similar to those which Mr. Liébert employs at his studio in the Rue de

Londres, these having already been fully described in the Photographic News.

Dispersed through the Electric Exhibition are many interesting photographs of the electric spark, and of the carbon pencils between which the electric arc is burning; but the most interesting photographic exhibit is a magnificent series of pictures representing Edison's establishment at Menlo Park. Here we have, for example, a series representing the making of the incandescent lamps, the blowing of the bulbs, the carbonization of the strips, the exhaustion, the mounting, and the packing. "It is a real visit to Menlo Park," said a Frenchman at my elbow. Truly a wonderful agent which thus bridges over a gulf of many thousand miles in an instant.

Noticing that your able Paris Correspondent promises some details regarding the exhibition, I will bring my discursive remarks to a close.

◆

FRENCH PORTRAITURE.

BY W. G. SHAW.

Wishing to see something more than the specimens of foreign portraits which customers occasionally bring to the studio to be copied, accompanied by the stereotyped remark, almost amounting to a snub, that "French photographs are *always* so beautifully clear," led to a determination to seek an engagement in France.

The only practical way of learning any system is to work with it; and although the visitor or casual observer may see a great deal, there are generally many things behind the scenes which he has no opportunity of noticing. Let me here mention the kindly interest and assistance afforded me by M. Léon Vidal, whose name and excellent articles are familiar to every reader of the News.

At the time of my arrival few French photographers had commenced gelatine plates; and on paying a visit to M. Fürst, of Nantes, I found that gentleman very interested in the development of the process. He is certainly one of the first photographers in the provinces (a second Faulkner with children), hence his keen interest in a rapid process. Mine were the first specimens he had seen of gelatine plates, and, if it was on account of their favourable impression that, six months afterwards, when paying another visit, I found the silver bath banished from M. Fürst's studio, I may flatter myself with having, for once, helped to push forward the standard of progress.

In the studio where I was engaged (which for elegance of reception-rooms and general effect I have not yet seen equalled) the *specimens* were, some of them, very fine; but the amount of retouching was enormous. "English and American retouching is bosh!" M. Marmoury used to say. "Impossible to work fine enough upon the varnish;" and I must own (although prejudiced at first) I found the needle upon a gum surface infinitely superior, if not overdone. As an example of the principle laid down, let me quote a circumstance. A plump dame of forty was the sitter, and, on finally examining the negative (wet plate), M. Marmoury said: "Now then, do you know what we must do with this? *Il faudra couper des bif-steak.* Don't you do that in England?" I replied, half jokingly, "No, we have too much respect for the truth." "The photographers who have too much respect for the truth die of hunger in France," he answered. "Please the public, and they will pay. Take whatever pictures you like, and how you like, and if my clients appreciate them, I will cry Bravo! and raise your salary. If we sent out this woman as she *is*, it would be refused; but, by reducing the waist, and taking a good slice off the shoulder, she will be delighted with it." Moral: A third of the waist vanished, and a pound off the shoulder.

A peculiar feature in the printing department of this establishment was, that the responsible printer was deaf and dumb. He had been with the same employer eleven years, and did his work extremely well; would not suffer any one in his printing-rooms, "except on business," as it distracted attention from his occupation. His quickness of perception in any little business arrangement, and readiness in understanding signs or half-written sentences, were marvellous. I noticed that he eyed the first few dry plates rather suspiciously, and could scarcely be persuaded to take a proof before they were varnished.

Most of the cartes and cabinets were enamelled, but the plain portraits were always so cleanly finished and nicely packed, that it gave them an air of refinement which much of our English work fails to attain. Critically speaking, the negatives were really inferior to what is produced among good photographers in this country. They lacked variety, were tame, and commonplace; but at home we sadly miss their careful printing and style of finish in our everyday work.

I am convinced there is nothing for a good English operator to learn in France, except cleanliness and order. The compulsory military system helps to make Frenchmen tidy, and the habit once attained follows naturally.

Dry plates will never be so extensively used as with us, on account of the glorious light they have at command. Four seconds for a wet plate in the studio will scarcely prompt the extra expense of gelatine, as they are undoubtedly dearer. For children, out-door work, and portraits of deceased persons, in which they do a good business, their usefulness must and will be acknowledged.

The Sunday work is, to an Englishman, the curse of French photography. He cannot avoid doing it, and it is excessively wearying. I refused one engagement entirely on that question, and was considered exceptionally fortunate to get where I had one Sunday free every fortnight, although even this I found very irksome at last.

There appear to be many more amateurs in France than with us, but they are not, I think, generally so proficient. One gentleman I met was preparing his own gelatine plates very successfully; he was most enthusiatic, and freely showed me his process. The finished negative had a beautifully rich brown tint after it was intensified. An instantaneous view (taken from his window) of the cathedral, and developed with

No. 1.—Neutral oxalate of potash	300	grammes
Water	1000	„
No. 2.—Sulphate of iron	60	grammes
Alcohol	40	„
Acetic acid	60	„
Water	1000	„

Equal portions of each solution, mixed just before using, to which some drops of a bromide solution were added to check the rapid action, which results in lack of density.

Supposing, from some cause or other, the negative lacked density, six grammes of iodide of potassium, and four grammes bich. mercury (dissolving the iodide first) to 200 grammes of water were used to whiten the negative, which, after washing, was placed in 100 grammes of water containing eight grammes of hyposulphite. Thorough washing completed the manipulations, and gave an excellent result.

French sitters are, as a rule, good subjects. They pose easily, and know how to dress. They want nice portraits, and are critical of proofs, but will help you all they can to secure the best results, and will pay 30 francs per dozen for them. The selfish impertinence of some of our English sitters is seldom met with.

Combining these advantages and the superior climate, a greater success should result, and it would not be a subject of surprise if we had to play second fiddle; but I honestly think that the average work in England can hold its own as yet; variety of pose, technical excellence, and style, or "go" being our stronghold, while for tasteful finishing and excessive retouch, we must give the palm to our polite and agreeable neighbours.

THE PAST AND PRESENT OF MAKING SUN PICTURES.

BY E. T. WHITNEY.*

It may interest you if I speak very briefly of the manner of our working, of the struggles we encountered, and the difficulties experienced in getting a suitable light, contrasted with the facilities of the present, hoping that my remarks may be of a practical character.

The Daguerreotype plate composed of copper, and plated on one side with silver, when properly cleansed and polished, was exposed to the fumes of iodine only. In 1840 Professor Draper made the first Daguerreotype in New York. The sitting was one hour. Subject: His mother, with eyes closed. The picture is still preserved, and highly prized. The length of time needful to make a picture was reduced from ten or fifteen minutes' time to one minute and thirty seconds. Southworth has a Daguerreotype of his lady, 1842. In 1844 or 1845 the addition of bromine to the iodine coating was found a great accelerator; but caused much trouble by flashing over the plate, and fogging the image. In those days we experimented with closed doors each morning, before admitting sitters, and often found occasion to dismiss the subject without a picture, with excuses about the weather, dampness, &c. These troubles lasted until it was discovered that lime would hold the bromine, and let off the fumes gradually, thus enabling us to get an even coating on the plate.

Still another important discovery was made that caused as much satisfaction to Daguerreotypers as albumenizing the glass plates did to photographers. I allude to galvanizing the plates with a coating of pure silver. Now we had comparatively plain sailing, and the only remaining difficulty was to get a suitable light. The landlords in those days—and, in fact, the public generally—had but little faith that the business would ever amount to anything, and to cut into a building for a skylight was monstrous. Finally I succeeded in getting a building erected on the roof of a four-storey building, with a skylight 12 by 16 feet, six feet from the floor, at an angle of 48°, with this light. The Daguerreotypes on exhibition were made in 1848. This year I made the first exhibition of sun pictures ever made in the United States at a State fair in Syracuse; and the same year—assisted by G. W. Barnard and Mr. Davies—organized the first convention for the promotion of the art, and to regulate prices; for even at that early day we had to contend with the cheap man. At that meeting a resolution was passed that no person be admitted to membership except he would agree not to take pictures for less than one dollar and fifty cents; also that none but practical artists, actually engaged in making Daguerreotypes, should become members. At a subsequent meeting in New York, in 1851, similar resolutions—but more stringent—were passed, and, for a time, rigidly enforced.

But we have done with the past. The beautiful Daguerreotype is no more called for; but its lessons are not lost in this age of progress—lessons of patience and endurance needful to prepare us for the still greater difficulties pertaining to making photographs at that early day. I will not attempt to enlighten you upon making photographs. You have passed from the necessity of making your own gun-cotton (as we had to from making gutta-percha bottles), and trays to hold your solutions; from albumenizing your paper, &c.; all these things are prepared for you, and can be bought. You have passed from the tedious sittings with the wet, and now, with the dry plates and rapid shutter, take your sitter unawares, thus securing a life-like expression. What do we want more? By very many there is lacking tact, taste, and skill. You may have all the appliances, but without avail, if you fail to have tact to interest your sitter, and seize the right moment for expression, taste to arrange suitable surroundings, and skill to complete the work. How are these to be attained, if we feel a desire to rise higher in the art? I will give you my experience. When I found a photographer making better work, getting better expressions, getting better prices, than I did, I determined to find out the secret of his power. Such a one I found in Frank Pearsall, of Brooklyn. Let me give you a sample of his treatment of a sitter. I do not think he would object to the exposé, as I believe it is understood there are no secrets in this age; and if it is not so understood, the sooner we make that obligation on each member the better. Well, to my subject—Mr. Pearsall in the studio. The subject to be photographed having arranged all preliminaries at the desk, the particulars telephoned regarding the size and style of the picture wanted, Mr. Pearsall has that portion of his studio arranged for the subject that affords the most suitable light and shadow. While the plate is being prepared, Mr. Pearsall greets the sitter, and conversation begins. The studio, aside from being elegantly furnished, is filled with bric-a-brac, toys of various kinds, music-boxes, and dancing figures to amuse old and young. The objects excite curiosity, induce questioning, and sitter and artist get in familiar conversation; the sitter is shown a seat, which is taken more as a rest than with reference to having a picture taken. Should the position be natural and easy, the chair is wheeled in proper light, the head-rest adjusted, and the assistant with the prepared plate puts in an appearance. The camera has an elongated slide (Mr. Pearsall's patent) that receives the plate on a line with the focus-glass. The assistant then proceeds to focus the sitter, then slides the frame, at the same time drawing the slide. Meanwhile Mr. Pearsall has the sitter well in hand, and keeps up conversation while adjusting a singular piece of mechanism which may or may not be intended for an eye-piece; but his movements excite a lively interest on the part of the subject, and when the right expression is obtained, the rubber ball is squeezed, and one picture is taken. Then he snaps his fingers, which being understood by the assistant operator, the slide is moved for the second exposure, and, under pretence of focussing, the interest of the sitter is maintained until a second sitting is made. Before I understood all these points, Mr. Pearsall invited me to sit for him; two plates were used, and four pictures taken without my knowledge, and this was before we had the dry plates, or the quick process. The result was the only good photograph I ever had. Is it any wonder that he has a profitable business at remunerative prices!

A DAY'S RIDE.

BY GEORGE BRADFORDE.

"Going Away!"

I had long promised myself the pleasure of a day—a whole day—among the woods and glens, the mountains and streams of "Ould Ireland": a day with nature—a day away from the hurry and roar of the smoky city; and at last came the opportunity. So, with camera and plates packed all ready at night, I went to bed with that peculiarly happy feeling that takes possession of one when anticipating some great pleasure. I had been asleep, as I thought, only about an hour, when I felt a pair of tiny arms clasped round my neck, and a small voice shouted in my ear, "Wake up, dad! i'sh a boo-tiful mornings, and when is the car coming, and shall we have to feed the horse, and will he eat anything else but grass?"

I looked upon the little whitegowned figure by my side, and saw in the eager face that all the fun would not be mine alone—that another would share the treat with me. How many questions were asked that morning I cannot tell, but will leave the matter to all fond fathers to fathom. At last Andy Flinn drove up to the door with a flower in his button hole, and his Sundays garb on; and now commenced the bustle. The youngster had clambered up on the car before it was well stopped; the missus had to return five times for some wraps; the provender had to be stamped into the well of the car; while Andy, wiping the honest drops from his brow, asked sarcastically "if I was sure there was enough of "refreshments?" At length we got a start and rattled along the lanes to Donnybrook. This was where the great fairs used to be held; the principal articles dealt in being, whiskey, shillelaghs, and broken heads. "Be gorra!" quoth Andy, as he sorrowfully pointed his whip to the fair green, "it's there the ructions used to be." And now we go rattling along the road to Goatstown; I took my first negative close by the entrance gate to Clonskee Castle—a piece of roadway shrouded by thick umbrageous foliage, and yclept the Lovers' Walk; there was no sun at the time, so I gave four seconds' exposure with a 5D Dallmeyer view lens, and Swan's dry plate. This plate turned out splendid—every leaflet being as sharp as a needle, while the shadows were remarkably clear for a dry plate.

---

* Extracted from a communication to the Photographic Association of America.

And now we are once more on the road, and come to the unpicturesque village of Dundrum: here Andy expressed great concern about us having some "refreshments," and so pathetic was he over the excellence of some seven year old malt, that it would have been a sin not to have humoured him by having just a thimbleful. There is nothing to look at at Dundrum if you except the old churchyard on the knoll close by the railway station; the houses are all being rebuilt, and give one an idea that colds and neuralgia lurk within their walls. Just outside Dundrum, Andy Flinn drew up at a funny iron gate and pointed to it with the air of a man who means to astonish you. I felt sure that some tale of horror was on the tapis, so I lent an attentive and a serious ear to what was to be said.

"That's the pond, sor," quoth Andy.

"Well, what the dickens——."

"Sure, sor, I thought you was pickin' up curiosities in this counthry, and that same is the greatest curiosity that I know of; for the beasts that are put in there have to grow fat upon paving stones—it's a miracle, sor; it beats Knock all to pieces.

Once more on the open, and we had a view of the great and small Sugar Loaf mountains of county Wicklow. As we drove along between the flowery hedges, we came to a spot where, on a brighter day, a capital view of Dublin Bay and Howth in the distance could be obtained; but I had to content myself with having a dab at a "Rath," a small circular piece of woodland held in great veneration by the peasantry; to break a twig off a tree in these magical circles is enough to bring ill luck upon you for life; they are supposed to be of Druidical origin, but as little is known of them as of the "Irish round towers" that I daresay you have heard of. Now we had a bit of hill work—a couple of miles to walk—and at length sighted the remarkable village of Stepaside; I think it should be step-a-side, for hardly had the rattle of our wheels sounded on the long street when troops of urchins came tumbling heels over head out of every cabin, and flocked around the car in hundreds.—"Penny, sor; penny, mam!" How it was that Andy Flinn did not maim a dozen or so of them I do not know: rags and dirt and yell! I thought of a picture I once saw of a fierce-looking Russian being chased by hungry wolves, and felt glad when I saw Andy apply the whip smartly to the old mare.

Through another "Lovers' Walk," and at length we burst upon the best part of the road—the Skalp Rocks of Enniskerry. The Pass here put me very much in mind of the Cheddar Cliffs, only not so grand. There is more slope at Enniskerry, and the rocks could be better described by being called boulders, as I do not think there is what might be termed a real cliff in the whole pass—the largest rock being the "Devil's Peeble," a piece of stone about sixty or seventy ton, laying at the entrance of the Pass. Of course there is a legend about it. The devil threw it at St. Patrick, or some other clever fellow that he could not circumvent, and there it lies to this day. We stopped here to lunch, and I took the opportunity to secure two negatives, one looking along the road we came, with the rough sides of the Pass as a foreground, and a small well-kept cabin backed up with trees as a background. Turning the camera round, I secured an instantaneous picture of the other end of the Pass. It is a grand piece of scenery: stunted firs sticking out from the rocks at all manner of angles—purple heather—waving bracken—golden gorse, and the homely ivy creeping out and in among the boulders. To the left you have a peep of the Dargle in the distance. To the right looms the frowning brow of the great Sugar-loaf Mountain, all going to make up a picture well worthy a fight with the camera and the dark tent. After having refreshed the inner man with cold fowl and Bass, we took the road again, and came upon the clean and beautiful village of Enniskerry. We were now upon Lord Powerscourt's desmesne, and could not but admire the rich and fertile country that hails the noble lord as master. If I had met him, I would have liked to ask the name of the lunatic that designed the pump—fountain, I mean—in the square of Enniskerry. A clumsier looking thing I never saw in my life; it looks like a ventilator to a sewer, or the chimney of a bottle work. Andy Flinn was very anxious for us to see the entrance gate of Lord Powerscourt's estate, situated at the top of the hill opposite Enniskerry Church. Now entrance gates, as a rule, are very much alike—a piece of masonry with some heraldric device, or a spread eagle, on top, putting one in rememberance of Sham Castle at Bath; so that I failed to understand Andy's solicitations to draw up at the "Leinster Arms" until, with smacking lips, he commenced to extol Mr. Millar's "malt." Then our eyes were opened, and we saw. However, I do not regret staying for half-an-hour with the courteous host of the "Leinster Arms," and I shall not forget the calm and placid "smoke" that I enjoyed in the rustic seat before one of the arbours of his garden, for some time to come. At length Andy, with a beaming face and a sparkling eye, announced that he was ready, and off we went along the winding Dargle and so on to Bray, where we proposed to dine. That is the "going away" by the Enniskerry Road; next you shall have the "Coming Home" by the Bray Road.

Correspondence.

PHOTOGRAPHIC SOCIETIES.

Dear Sir,—Now that the societies are about commencing their winter meetings, a few suggestions for their more successful management may not be without interest.

As a rule, the task of entertaining, by reading of papers, demonstrations of processes, the submitting of results of experiments, &c., is centred in a comparatively small proportion of the members in almost every association. "The fewer men, the greater share of honour," and by all means let us give it them, for keeping our meetings going. But there are many other aspirants to fame in this respect, in the main body of the members, who, for one reason or another, hold aloof.

With some, although having, as it were, the science practically at command, conversant with its every detail, yet their presence is not felt, "their light is hidden under a bushel," they take no part in the deliberations and pass away as they came. Possibly they are afraid to venture on the arena of public discussion; they have not yet discovered they are as good as their neighbours, if not better; have not "crossed the Rubicon" of bashfulness in public speaking, and shy at the attempt. In the words of Lady Macbeth, "The attempt, and not the deed, confounds us." To such I would say, throw off the reserve, make your plunge, and the attempt will ensure success. There is, again, another class, who are in every sense of the word speakers, accustomed and practised, willing to face the auditorium, and, while instructing themselves, are wishful to contribute their share to the general fund of knowledge; but they lack a subject, and waver through the whole session unable to settle their ideas on a fixed topic, and so are profitless to the Society. It is for this class that I would specially claim attention. Give them a subject; let the councils of our societies make a printed list of debates or essays likely to attract their own members' attentions; let there be abundant variety, and the chances are, some recluse may be tempted from his retirement, and be set going.

Another little innovation that might bear fruit is the giving of progressive lectures on photography. Let them commence at the fundamental principles of the science, and be aided with practical illustrations. Say a quarter of an hour every meeting night devoted to these would tell with satisfactory results. Various members could take their regular turns at these little essays, advancing from where the other left off; this would induce fresh members to enter the photographic ranks, and, besides suggesting many points worthy discussion, would tend to clear up not a few vague notions of theory.

Occasional social meetings, too, should not be lost sight of. The success of these has been proved in some notable instances, and should be more generally adopted; they tend to bind a club together, and give opportunity to those who can shine in a sphere of jollity, but are dumb in solemn assemblies.—Yours truly, A MEMBER.

AMATEUR PHOTOGRAPHIC SOCIETY FOR SOUTH WALES.

SIR,—May I ask through your NEWS, are there not amateurs valorous enough to engage in the formation of a society to be held in a central place such as Cardiff?—Yours, &c., J. J. M.

Proceedings of Societies.

THURSDAY EVENINGS FOR PHOTOGRAPHERS.

AT the meeting held on the 21st inst. (Mr. RIEMANN in the chair),

Mr. F. YORK exhibited, by means of the optical lantern, a very fine series of transparencies, being "Life Studies," illustrating (in a manner far superior to any hand-painted slides) the following tales:—"Little Nell's Wanderings" (from "The Old Curiosity Shop"), "The Gin Fiend," "Meg and Her Brother," "A Trap to Catch a Sunbeam," and "Friendless Bob." The figures were all photographed from life, and, as far as possibe, the accessories were also taken from nature.

Slides were also exhibited by Mr. Cobb, from negatives taken on board a river steamer, of passing boats, &c.; by Mr. Henderson, of views of York, among these being one from the tower of York Minster; and by Mr. Cutchey, of views in Cardigan and Essex.

A cordial vote of thanks to Mr. YORK terminated a very interesting evening.

Talk in the Studio.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.—The first meeting after the recess will be held on Thursday next, October 6th, at 8 p.m., in the rooms of the Society of Arts, Adelphi. Mr. W. T. Wilkinson will read a paper on "Reproduction of Small Negatives for Single Transfer Carbon Printing," and Mr. Archer Clarke will open a conversation on "Developers for Gelatine Plates."

GELATINO-BROMIDE FILMS.—Mr. Werge has been good enough to send us some of these films of Mr. Pumphrey's manufacture, and we have tried them with considerable success. They are endowed with a high degree of sensitiveness, and yield negatives with plenty of vigour. Of course there is more work connected with their manipulation than in the case of ordinary dry plates, but then, on the other hand, there is the advantage, at any rate to travellers, that they are neither so heavy nor brittle as coated glass plates.

SOCIETY OF ARTS.—The following circular has, we are informed, been issued by this Society:—"Dear Sir,—After Christmas Captain Abney will give a series of lectures here on 'Recent Improvements in Photography.' It would, I think, add much to the interest of the lectures if members and others attending them could have an opportunity of seeing examples of the most recent photographic apparatus, &c., and I am therefore endeavouring to ascertain if it is possible to get together a small Exhibition which might be on view during the lectures. We have sufficient room here to show such a collection, and I propose to devote one or two of our rooms to the purpose. Would you kindly let me know whether you would be willing to send down for exhibition any articles which you think would be of interest, and, if so, what amount of space you would like placed at your disposal? I need not add that there would be no charges of any sort in connection with the Exhibition. The precise arrangements for the Exhibition can be made later on, as soon as I can see how far the suggestion will meet with support.—Yours faithfully, H. T. WOOD, Secretary."

To Correspondents.

⁂ A cheque for two guineas will be given for the best "Reception Room Notes—No. 3. Cash at the Time of Sitting: How I get it," to be sent in by the 1st Oct. No name need appear. For rules, see previous numbers of NEWS.

CAPTAIN TURTON.—There is no better way than the one you mention. Half ether and alcohol would be a quicker mixture. Filling a shallow bath with alcohol and covering same with the negative will frequently effect the same purpose, but not always; as it is a question of evaporation, this second method takes longer.

E. H. M.—You cannot buy the paper ready gelatined, but you hardly require to do so, since its preparation is so simple. Take care you get bank post paper, and not ribbed. This is the toughest, and consequently the best. You cannot get it at every stationer's unless they will specially order it for you, but houses like De La Rue, Waterlow, &c., will supply it.

E. F.—See our "At Home" at a City Phototype Establishment, or Mr. Butter's topic on Photo-lithography early last year. Zinc is treated like stone, and is not sensitized at all; the greasy ink transfer is pressed in contact with the zinc, and this is then etched, and rolled up with ink roller. When the design in ink is once on the surface, it will keep, with care, indefinitely.

NORTHUMBERLAND.—1. Raising temperature, as you specify, would also raise sensitiveness. Your mode of mixing is good. See our NOTES this week, as to increasing sensitiveness. 2. Good diffused light; but you can only judge what is best by practically trying from various directions. In a coming "At Home with Herr Angerer, at Vienna," we shall allude to the matter. 3. They are to be bought in the London streets, but perhaps Mr. Werge could supply you.

CIAPPI.—Unfortunately, an article to fulfil the conditions you require has not yet been invented. Of those which we have seen, the simplest are the best. Our advice is to construct one on any simple plan (such as have been described), and to wait awhile for something better. Will you please write to the "Editor" and not the Publishers, when requiring similar information, which we shall always be ready to give.

J. S.—We have tried the mixture with soda water glass, and find that if you filter and coat at once, you can get it upon the plates before it jellifies. Try the substratum given in "Herr Albert At Home."

J. T.—See p. 22 and also p. 43 in Eder's "Modern Dry Plates."

TYRO.—Yes, Morgan, of Greenwich. There is no other of the same name.

BRIGHTON.—Because you did not send us your address.

RHODA.—1. We cannot give the advice you ask. We have personally tried the plates of the two makers you mention, and were well satisfied. 2. Certainly, see what you can do towards making them yourself. Both Abney's book and Eder's are to be had of our Publishers; and there are also full details in the YEAR-BOOK.

W. H. DESLANDES.—It is the imperfect removal of the hyposulphite that is probably at fault. Wash well, and employ a strong alum bath. You will find the best intensifiers detailed in the YEAR-BOOK; these do not stain if proper precautions are taken. Try a dilute solution of cyanide of potassium—three per cent.—for removing stains, but employ it carefully.

A CONSTANT SUBSCRIBER.—You must tell us first of all what is the nature of the electric light you propose to use. Most of the lights at present in use are set in action by a small gas-engine; but for a magic lantern there is none just now that would be suitable for you. You must wait a little longer for electricity. Most photographic lenses will do for the lantern; diameter and length of focus depend upon what sort of an image you want. Try any instrument you have first of all. *Chloride* of potash will not give you oxygen, but the chlorate will; 100 grains of chlorate yield nearly 100 cubic inches of oxygen.

SOUTH DEVON.—Crystal varnish is made of pale Canada balsam and rectified oil of turpentine in equal parts. Strong alcohol would remove it; 40 per cent. of the balsam is soluble in alcohol, and the rest, if not easily solved, is removable after soaking.

A GLEANER.—The Autotype Company use the carbon process for burning-in: possibly they might grant you a licence. Ordinary transferred images cannot be burnt until the gelatine they contain has been removed. The dusting-on process is, however, usually employed, and you cannot do better than read Mr. Cherrill's paper in the NEWS for 1878, p. 55, &c.

W. R. ORD.—We will give the subject of your note our attention; it must be very annoying. Do the articles come by book-post or letter-post? If the former, no sealing wax is permitted, and this may be the reason for its being broken.

J. S.—Certainly; reduce the amount of chrome alum. Diffused white light would not be injurious if care were taken.

DRY PLATE.—Your calculation is incorrect. The quantities as they stand ought to be, 369 grains, 10 ounces 5 drachms, 693 grains, 510 grains.

R. B. G.—In our next.

Several answers crowded out.

THE PHOTOGRAPHIC NEWS.

LIBRARY

Vol. XXV. No. 1205.—*October* 7, 1881.

CONTENTS.

	PAGE
Instantaneous Shutters	469
Positive Pictures on Gelatino-Chloride	470
French Correspondence. By Leon Vidal	470
By-the-Bye.—Business Tact	471
Photography to Aid Individual and National Education. By Thomas J. Pearsall, F.C.S., &c.	472
Notes	474
Topics of the Day.—Wanted, an Operator. By Cliff	475
A New Method of Taking Transparent Positives. By Captain Biny	476
A Day's Ride. By George Bradforde	478
Green Fog. By A. J. Brown	478
Correspondence	479
Proceedings of Societies	479
Talk in the Studio	480
To Correspondents	480

INSTANTANEOUS SHUTTERS.

THERE has been considerable discussion as to which is the best position for a shutter. Whether it should be placed in front of the lens between the combinations, or behind them, as to whether, in the first place, the amount of light allowed to pass is greater in any one case than in the others; and in the second place, whether the distribution of the light over the plate is altered in any way by altering the position of the shutter.

We propose briefly to discuss this matter, which is of great importance in connection with instantaneous work.

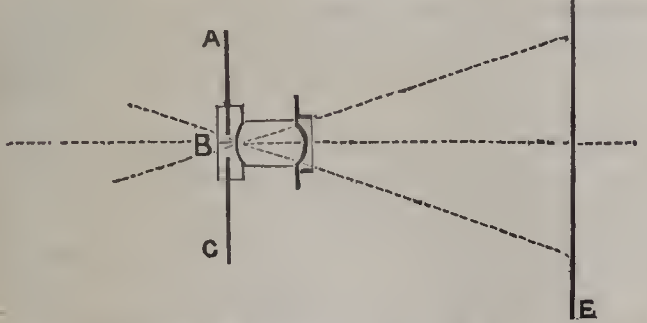
Shutters may be roughly divided into two classes—first, those which consist of one opening passing across the lens; and second, those which have two or more moving parts, and which open from the centre.

The first of these is probably the commonest form of shutter, and under certain circumstances is a perfectly efficient instrument, and of it we may say that change in its position makes practically no difference whatever, either in the amount of light which it will allow to fall on the plate, or in the equality of illumination which will result from the use of it; that is to say, always supposing that if it is used either before or behind the lens, that it be placed as near the glasses as possible, and that in any case the opening be at least as wide as the diameter of the lens.

We pointed out some time ago that any "rapid" lens used full aperture must give considerable inequality of lighting. This must always be the case, but this inequality will not be in any way increased by using a shutter which consists of one opening passing across the lens, whether it be in front, or behind, or between the combinations.

It is far different, however, when a shutter opening from the centre is used. We here give three diagrams to illustrate our meaning.

FIG. 1.



In each of these we have shown a lens of the "rapid" form, and have shown the shutter opening from the centre, and just having commenced to open.

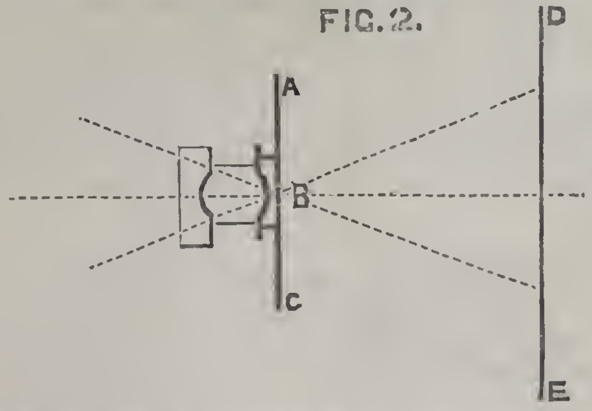
In each case A B, B C, represent the two moving parts of the shutter, and D E the plate.

Now, taking first fig. 1, where the shutter is placed in front of the lens, it will be seen that, when the shutter begins to open, only a comparatively small central part of the sensitive plate receives any light. The only part that is lighted is the base of the cone whose apex is the opening between the shutters, and which is bounded by the posterior part of the lens.

Now, supposing the two openings to consist of lozenge-shaped apertures, whose diagonal is equal to the diameter of the lenses, it will be seen that, as the shutters open, this cone of light gradually widens out until, when the shutter is full open, the whole of the plate is illuminated as equally as the lens is capable of doing it, but this only for an indefinitely short period; that is to say, that the central part of the plate receives light from the beginning to the end of the exposure, but the edges are only illuminated for an indefinitely short period. Hence there results excessive inequality of illumination.

A glance at the second figure, which shows the shutter behind the lens, will show that the effect in this case is almost precisely the same as in the last.

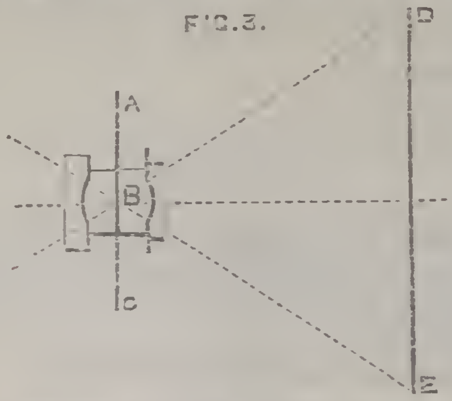
FIG. 2.



A little reflection will show that if, as we strongly urged in our last article on the subject of instantaneous shutters, the openings be made long in the direction of their motion, the inequality will be very greatly reduced, as then the edges of the plate will receive all the light that the lens is capable of throwing upon them during the whole time that the shutter is fully open.

Looking now at fig 3, we shall find that things are quite different. Here it will be seen that immediately the shutter opens, the plate receives as equal illumination as it ever can receive, even with a small stop. In fact, the conditions with regard to the lens are exactly the same as if a small diaphragm were inserted. As the opening increases, the equality of illumination will decrease—not, however, on account of the action of the shutter, but simply on account of the necessary imperfection of a lens used with an aperture equal to, or nearly equal to, the diameter of the combinations. In this case the equality of illumination will be somewhat *greater* than it would be were the lens used full aperture in the ordinary way, as, in fact, it may be said to be the result of a combination between a full aperture exposure, and exposures with different sizes of central diaphragm down to the smallest possible.

FIG. 3.



In a shutter opening from the centre, the total amount of light falling upon the centre of the plate will be practically the same, whatever be the position of the shutter. It will be a little the greatest when the shutter is behind, as the rays will be somewhat condensed by the time they reach it. This holds of a single action shutter also.

The practical deductions from what we have said are :—

1. That the total amount of light reaching the centre of the plate is the same wherever the shutter be placed in relation to the lens.

2. That the equality of illumination in the case of a single opening crossing the lens will be the same, whatever be the position of the shutter in relation to the lens.

3. That in the case of a shutter opening from the centre, the inequality of illumination will be excessive, if the shutter be placed either behind or in front of the lens, but that

4. The greatest possible equality of illumination will be gained by the use of a shutter opening from the centre, and working between the combinations.

We should mention that with a single aperture shutter the best results will be obtained when the motion of the shutter is in the direction of the length of the plate.

There are certain objections to the use of a single aperture shutter which make it desirable in some cases to use a double action one. We shall discuss these in a future article.

POSITIVE PICTURES ON GELATINO-CHLORIDE.

Final Article.

A form of the hydro-kinone developer which Dr. Eder and Captain Pizzighelli recommend is prepared as follows :—

Water	100 volumes
Alcoholic hydro-kinone solution, 1 and 20	4 ,,
Sodium chloride solution, 1 and 30	12 ,,
Ammonium carbonate solution, 1 and 30	20 ,,

This is considerably slower in its action than the iron developer previously described, and an exposure of three or four times the usual length is advisable. Another point to be remembered is the circumstance that pictures developed with hydro-kinone are very much more reduced during the operation of fixing than is the case with pictures developed by means of iron; and it is consequently necessary to carry on the action until the picture appears much denser than it should ultimately remain.

The hydro-kinone developer yields, in the case of the non-ammoniacal emulsion, very fine yellowish-red or bright-red tones, well adapted for lantern transparencies or for transparencies intended to be used in making enlarged negatives, while the ammoniacal emulsion gives greyish red and unartistic tints. An ordinary gold toning bath slowly changes the colour of the reddish images to highly pleasing violet tints. Should it be wished to obtain more intense images than are yielded by the developer as described, it is merely necessary to give a longer exposure, and to dilute the developer with about an equal bulk of water. A diminution in the proportion of hydro-kinone, and a corresponding increase in the ammonium carbonate, tends towards flatness and fog; a similar result also following any considerable diminution in the amount of sodium chloride present. Any considerable increase in the proportion of sodium chloride or of hydro-kinone is undesirable, the former leading to extreme hardness and deep ruby shadows, while the latter causes a greenish fog to form over the transparent parts of the picture. A simple addition of more carbonate of ammonium is useful in case of under-exposure, but the results are not nearly so satisfactory as when the correct exposure has been given and the normal developer used.

As a rule, the gelatino-chloride pictures tone with some difficulty, an ordinary neutral gold bath acting with extreme slowness; but the following answers very well in all ordinary cases :—

No. 1.—	Water	500 parts
	Ammonium sulphocyanate	20 ,,
	Sodium hyposulphite ...	1·5 ,,
No. 2.—	Water	500 parts
	Chloride of gold solution 1 and 50 ...	40 ,,

For use, equal parts of the two solutions are mixed, and the fixed prints are immersed, but care must be taken not to allow the pictures to remain too long in this bath, or the more delicate half tones will acquire an unpleasant bright blue tint; by careful watching, however, it is possible to obtain a very considerable variety of tones.

The chloride emulsion process appears to possess very notable advantages over the bromide method for the production of positives on paper, and the paper may be coated with emulsion just in the same way as carbon tissue is prepared, the plain paper being drawn over the surface of the melted emulsion. Another method adapted for the production of small quantities is to rub a glass plate with French chalk, and coat with emulsion. After this has set, a sheet of damp paper is squeegeed down upon it, and when all is dry, the gelatino-chloride paper may be stripped from the glass, the French chalk serving to prevent adhesion.

It is to be hoped that many of our readers will profitably occupy themselves in following out the above described methods of Dr. Eder and Captain Pizzighelli.

FRENCH CORRESPONDENCE.

Increasing the Sensitiveness of Gelatino-Bromide—To Prevent Frilling at the Edges of the Plates—Temporary Support for Developing Pellicle—Washing Pellicle without a Support—Exhibition of the Central Union in 1882.

Increasing the Sensitiveness of Gelatino-Bromide.—In previous numbers of this journal an account was given of the experiments of Messrs. Vogel and Stosch[*] in heightening the rapidity of gelatine plates by bathing them in an alcoholic solution of silver nitrate. Unfortunately, this treatment (though it increases the sensitiveness four-fold) deprives the plates of their keeping qualities; it makes them liable to fog, and the image dull and weak. Dr. Eder, in confirming the correctness of Vogel and Stosch's observations, expresses a hope that a method could be arrived at of preventing this change in the plate, while continuing to use the nitrate of silver bath to increase the sensitiveness. I am glad to be able to announce that our esteemed colleague (M. Ducos du Hauron) has obtained a solution of this problem. He has not only succeeded in making the plates four times as rapid, but he has also found a means of counteracting the fog so much complained of. His method consists in plunging the plates into a bath with the following formula :—

---

[*] See Photographic News, vol xxv., pp. 282, 303, 339, 398, and 405.

Distilled water	1 litre
Silver nitrate	10 grammes
Liquid acetate of ammonia	5 c.c.

In this bath the plates are left for a minute only, and are then dipped in an upright bath full of distilled water to wash away any trace of free silver nitrate. After this they are again washed in clean water, and then allowed to dry. According to M. Ducos du Hauron, the mere momentary contact with the silver nitrate is enough to give the plates an extraordinary sensitiveness, and the subsequent removal of that substance, when once the sensitiveness has been obtained, will not in the least lower it again. This is a very remarkable fact : the silver nitrate may be completely got rid of, and the plates will in consequence not undergo the slightest change. M. Ducos du Hauron is further of opinion that it might be possible to establish the contact with the silver nitrate simultaneously with washing the emulsion (subdivided into small pieces) in order to get rid of the soluble salts which accompany the silver bromide. In this way complete certainty would be obtained of the silver nitrate having been eliminated. If these indications be correct, we have arrived at a method of preparing emulsions of almost inconceivable rapidity. Where shall we stop? We shall soon be able to take photographs with the quickness of thought itself.

Prevention of Frilling in Gelatine Plates.—Reading the instruction given by M. Stebbing for working with his sensitive pellicles, I have been much struck by the ingenious plan which he recommends to prevent frilling. This consists in coating all the edges of the pellicle with a layer of some fatty substance, which has the effect of preventing water from penetrating between the layers of gelatine and collodion. It seems to me that the same result would be arrived at in case of gelatine plates by rubbing their edges with a bit of tallow, and I believe the suggestion was made in the News last year. Frilling commences always at the edge, and proceeds gradually to the centre of the plate. A fatty substance by its repellent action on water would prevent this effect which so often completely spoils the plate. At the time when dry plates were protected by tannin it was usual to prevent the collodion film from frilling by means of a varnish of gum lac passed over the edges of the plate with a brush. A similar precaution in the present instance seems to promise excellent results.

Temporary Support for Pellicles during Development.—As I have had occasion to mention these pellicles, so convenient to use on account of their lightness and toughness, let us say a few words more on my recent experiments with them I have already showed that they are liable to crack under development, if the dish in which they are placed for that purpose is not quite smooth and even at the bottom. An air-bubble gets under the pellicle and raises it, and then a crack will take place at that spot. The best way of avoiding this is to provide the pellicle with a temporary support, such as a caoutchouc varnish (a saturated solution of caoutchouc in benzole) spread thickly on a glass plate just as is done in the Woodburytype process to support the gelatine plates in hot water: when the excess of volatile solvent has evaporated, there remains on the surface of the plate a sticky layer to which the pellicle may be made to adhere by pressing it on to the surface with a glass roller covered with a piece of vulcanised india-rubber tubing.

Washing the Unsupported Pellicle.—When the operator has not at hand the means of providing a temporary support for the pellicle, it is better to dip it into water before developing, and then to place it all wet in the developer; no air-bubbles will then form, as is the case when the pellicle, laid on the bottom of the dish, is suddenly covered with the ferrous oxalate solution. But, if possible, the use of a temporary support is greatly to be preferred, since all the operations of development, fixing, washing, &c., can be carried on without touching the pellicle, and it may further be left on the support until dry. By proceeding in this way there is no risk of breaking the pellicle, which is liable to happen when the operator has not sufficient skill in manipulating.

Exhibition of the Union Centrale in 1882.—I have just received a circular of the Exhibition of 1882, to be held at the Palais de l'Industrie, by the Central Union of the Fine Arts applied to Manufactures. This exhibition is to include wood, fabrics, and paper. In the second section photography will be admitted as applied to the decoration of fabrics, and in the third a separate class will be formed for photographic papers. Besides, in the special competition among paper manufacturers, I find a prize offered for the "best decorative work, photographic reproduction, or any process depending on photography, and executed since 1878." It is a great pleasure to me to be able to record the proofs, continually increasing in number, of the important position conceded to the art of photography in the different exhibitions. Leon Vidal.

By-the-Bye.

BUSINESS TACT.

Some years ago—it may be twelve or fifteen—London was visited in rotation by several troupes of so-called negro melodists. For the greater part of the year they were in the provinces, but each in turn came to town for a time, occupying a well-known hall in Piccadilly. One of these troupes was owned by Messrs. A., B., and C. Mr A. was the Acting Manager—that is to say the business man, who made all arrangements, looked sharply after the money matters, and did all the clever advertising and billing; Mr. B. was the Bones, and a very comic Bones too; while Mr. C., a Corner-man, too, was likewise a most amusing performer. When the troupe of Messrs. A. B. and C. came to town, A. thought to himself it would be a capital notion to cease touring altogether, and to take a long lease of the hall in Piccadilly; in this way he could keep out other troupes, and his own minstrels get London all to themselves. He discussed the project with B. and C., and after some days' chit-chat together, these two consented. "While we are about making a change, though," said Bones, "we propose going a bit further, my dear A. I have been talking over the matter with C., and he quite agrees with me, that as you don't black your face and don't perform, you are scarcely entitled to so large a share of the profits. Now we think, that instead of sharing as before, if we allow you three hundred a year, as secretary, you ought to be satisfied." A. reserved his decision, but a day or two after told his partners he was content; henceforth he would be satisfied to receive the fixed salary mentioned. "But just one word," added A.; "where are you fellows going when you leave Piccadilly?" B. and C. thought they had not rightly understood. "Leave Piccadilly!" they exclaimed loudly; "why, don't you remember what we decided upon? We are not going to leave Piccadilly." Replied A. coolly, "Oh! yes, you are; I have taken a lease of this hall in my own name, and I have a troupe of my own coming here next mouth. I mean to make a pot of money out of the show, I can tell you. I can get any number of minstrels who will black their faces and sing comic songs for thirty shillings a week. All that is wanted is good management, and I can do that. But I will still be your secretary all the same, if you like. Where are you going?" Need it be said that Messrs. B. and C. were only too ready to go back to their original bargain; and how wise A.'s suggestion was that they should "never perform out of London" is proved by the princely income which for years past has come into the coffers of the troupe. Poor C. did not live long to enjoy prosperity, but they say the diamond brooch Bones now wears in his bosom of an evening is worth twenty thousand pounds.

This is a good example of what may be done by business tact. We have paid a good deal of attention in these columns of late to the question of art, but it is very necessary that photographers should understand business as well, if they are to be successful. It was with a view to discussing the commercial aspects of photographers, which have never been properly recognized, that we projected the essays that have appeared once a month recently—essays that are all the more valuable, since they are written by practical men and women. The best painting in the world, the most touching poem, the finest play, the most delightful entertainment, will never bring its author due reward unless it is properly put before the public. Unfortunately, clever men are apt to underrate business qualities, and this it is, more often than anything else, that lies in the way of their advancement. They see the works of second-rate men put before their own — work admittedly inferior—and they grow disgusted at the cruel neglect and non-appreciation of the public. But in nine cases out of ten they are neglected because the public never hears of them.

Take the example of two photographers in a provincial town. We will say they are equally competent to turn out good work, but one flourishes while the other does not. Yet their charges may be identical. But A. has secured a bright window in the High Street, and fits it out, if not with exquisite taste, at any rate attractively. (MM. Benque et Cie. owe their high standing in Paris in a measure to the fact that they have in the Rue Royale a gallery of popular portraits, together with a big group photograph representing a scene from the play which happens at the moment to be the most popular). A.'s pictures are bright and new, the frames are elegant, and there is a frequent change. A picture from New York or from Vienna exemplifying a new *format* is seen occasionally, and there are for ever new methods of printing, mounting, and glazing to be seen. A., in a word, impresses the townpeople with the idea that he is in front rather than behind the age, while B., perhaps, shows the same old specimens in the same old shop front for ten years together, and is heard to speak of "leather and prunella" in disparaging tones.

The way in which business is conducted indoors may also be as widely different. Here the great aim must ever be to get the confidence of the customer. Too much attention is often worse than too little; as everybody who enters a shop knows, to be obsequious is as bad as being too off-hand. A customer inclined to be obstinate, only becomes more obdurate still if he finds himself importuned. On the other hand, he may be willing to purchase, if he is but asked. It is here that business tact is valuable. Much wise advice has been given by the writers of "Reception-Room Notes" in these columns, and none more so than that tending to infuse a spirit of confidence into the stranger when he enters. Let him, by all means, have a card of terms at once, so that he may see that the prices are fixed. Let him have time to wander round unattended to look at specimens, so that he may alter his mind if he chooses, and fix, mayhap, upon some style of which previously he was ignorant. Every minute by himself increases his confidence, and then he may be spoken to in a much more chatty and satisfactory manner than before.

If a stranger "knows all about photography, don't you know?" when he enters, he should be received with deference. The chances are he means well, and will give a handsome order if treated judiciously. Receive information rather than offer it, and show an earnest disposition to agree with him, and to let him have his own way; whether he has it ultimately is another thing. But, at any rate, such customers—they are very frequent and trying nowadays—should never be thwarted, for they are easily put out of temper.

Of course, hints like these only refer to establishments which have to make their way. A firm of standing, when it has earned a reputation, can do as it pleases. It can conduct business with a high and mighty hand, and the more independent it is with its customers, the more likely are these to flock around; but this, after all, is only another display of business tact. At Drury Lane Theatre some years ago, at pantomime time, money was curtly refused at the box-office when people came to book seats, not because all the places were sold for that particular night, but so that people should be sent away empty-handed, or compelled to book seats weeks in advance. The report that Drury Lane was full was, naturally enough, a capital advertisement. For aught we know, some of our fashionable West End studios may do the same with their sitters—refuse appointments altogether, or postpone them for a fortnight or three weeks.

One business feature the photographer should never forget, that of publishing, if it is only a portrait here and there. We have already insisted upon the value of this plan of making one's name known; every shopkeeper who sells your picture, and every purchaser who buys it for his album, advertises your studio. It is rare indeed that even the most homely photographer in our quiet little towns and villages does not get his chance to publish a portrait, and if he has business tact, he never allows the opportunity to slip. The squire's slip of a son may develop into a hero at any moment, the village doctor may become one day the celebrated physician, the daughter of the agent—George Elliott was no other—shine forth unexpectedly as the brightest stars in the literary firmament. Many people secure permission to photograph great men or women; but few have business tact enough to make proper use of the advantage. Studios in London, and the provinces—those at the West End and fashionable watering places especially—are often regarded as galleries and lounges in which idle visitors spend a good deal of time, and if attractive pictures are displayed, it is natural enough that business is done. People like to look upon the features of this lion or that, and the portrait of anyone who has made a noise in one way or another commands a sale.

So that while it is very necessary to know how to produce a good photograph, it is quite as important to know how to sell it. It is not derogatory to be a good business man; we have only to regard the successful poet, the successful painter, the successful novelist or dramatist, and to ask what he charges for his works, to find that, thorough artist as he is, he is none the less a keen man of business. Unless he had been, he would never have attained the pinnacle of fame, at any rate not in his lifetime. By all means let us do all we can to advance the art and technics of photography, so as to secure pictures as perfect as possible; but no one is less an artist because he looks after his bread and cheese at the same time. Bear in mind that to be successful, an aptitude for business is all important; don't forget the acting-manager.

The "At Home" next week will be "Herr Prumm, Unter den Linden, Berlin"; the following "By-the-Bye" will be "On Tripods."

PHOTOGRAPHY TO AID INDIVIDUAL AND NATIONAL EDUCATION.

BY THOMAS J. PEARSALL, F.C.S., ETC.

The educational influence of photography has not yet been estimated; it may take time, but the time will surely come when all classes will appreciate the charms which the union of photography and art will convey to the young, and still more to advanced students, in their drawing lessons. Perhaps as nature itself does not give full incentive to learners and teachers, so it may be be that copies which too closely resemble nature may convey something of the same kind of awe and embarrassment to the pupils. Copies may have to be judiciously placed before them, the importance of the relative position of certain dots and the selection of certain lines as best adapted for the surface of the paper and the use of the black pencils, the crayon, or the shades of Indian ink, or simple colours; the object also being readily to use the muscles of the hand and arm without fatigue, and the faculties of observation of vision and of memory without exhaustion, &c.

The *limits* of any subject, say of scenery, may be indicate by dots or points; and mere lines horizontally drawn may give the bounds of a lake; gentle lines, the hills; some few more touches and lines indicate rocks and wild growth in the foreground, and then comparison with nature or a photograph will show the intent of the artist; and ever after the pupil will be able to recall the scene from the simple sketch, and appreciate the appliances of the teacher. In the following remarks there is no intention to exclude or degrade genius, the intention being to represent art as a language and as a source of pleasure, in studies of the objects of reality. The art of drawing is principally referred to: but it is also convenient to refer to the art of writing, which is only the ready means of drawing a few, very few, simple forms, the straight line, the circle, the oval, and the combinations to form loops How long, how wearily, is time spent to master these few forms; and the time spent and the suffering all come before those who have gone through a course of instruction without any aid from the truths, varieties, and beauties of nature. Now, in teaching drawing, some few dots, lines, little washes of tints, little bits of colour, all make up a little picture, which may recall nature. When a photograph is placed before them they forget the cruel tasks, and rejoice in the useful scaffolding that has enabled them to recall in fancy the perfect scene. Sometimes a child has a lithographic print set before him, where an educated man has freely used chalk and ink to produce effect, and finally scraped or cut out white lines out of a mass of blackness, and the copyist has only blacklead pencil, and has to leave the white paper, and can only produce an unpleasant smudge.

Photography is indeed a boon to the intellectual observer. Between real nature, and the real picture by photography, lies the great void to be filled up by man; he may make his transcripts of natural forms, but he must and does create the means of reproducing some of the visions of his own mind. All palaces, columns, terraces, and viaducts first are pictures in the architect's mind; the engineer and inventor see their ships and their contrivance first as visions of the mind, then art is called upon to give notions of the forms and forces, and thus art and chemistry combine to give a local habitation and a name to the dreams that are the visions of great realities yet to be constructed, and the student and inventor hopes for reward and character and daily recompense from these faithful pictures of contrivances to minister to man's comforts and pleasures, and as aids to the resources of his times and nation.

It is pleasant to hope that there may be a time when the enquiring mind of the young may be guided by the intelligent teacher, and both feel a reward in sources of natural beauty in the objects they indicate.

Those persons who recall their learning times, may refer to the inadequacy of the means to convey permanent and pleasant notions of perspective or of correct forms, and the various aspects of light and shade that accompany objects in nature. To be able to discriminate truthful outlines, to welcome pleasant lights and shades, and the play of gorgeous colours and frequent comparisons of art language with realities, may yet be a boon to willing youth.

Each class of objects may require distinct means to produce correct representations. That our public have to be educated there can be no doubt; but at the same time our public *have* art feelings of which artists but too frequently are in absolute ignorance. Among the most truthful and severe criticism will be found the expressions of those supposed to be ignorant of art when called upon and forced to express their opinions. The sailor, the agriculturist, and the botanist will astonish the artist; they laugh at the artist's ships and rigging; they despise the forms of the animals; and if the artist thinks himself safe to select subjects from flowers or horticulture, he will be astonished at their opinions and views from their observations of nature and their education. If compelled to speak, one objects to the lights on the fruits, for example; where in nature he would be dazzled by real reflections of light, he sees only the white of paper and paint, the distinctive speck of light in the human eye; he does not value, and thinks the picture is better without the white, which he says he never saw in nature; while the florist and botanist, rigidly keeping to severe outlines, and allowing a certain value to true local colour in proper places, is annoyed at the selection of forms and colours by the artist; all the gracefulness of stem and leaves; all the vividness of unexpected gorgeous colour, whether of vigorous life or ripening vegetable decay, goes for absolutely nothing. He "wonders that such a thing was admitted, and he is surprised by the artist's taste and selection."

Educated officials and persons may mildly put forward their ideas of the departure from strict truth, and the artist too often has to fall back upon its being unfinished as a sketch, but for pre-Raffaelite like demands for fidelity in representation, commend me to the expressions of uneducated people as conveying notions of art and truth to be guided and not to be under-estimated with impunity.

The geologist and traveller are aided by correct transcripts taken from the equator to the poles. The teacher of philosophy can have representations of machines and contrivances; the chemist can have the crystals and fluids and exceptional phenomena brilliantly displayed, and experiments of delicate arrangements and manipulations so rendered as to be accepted as the language of truth by students and by intelligent assemblies.

The microscopic forms, delineated at times with skilful artistic results, now yield pictures to photographic films that can be enlarged thousands of times; so micro-photography will soon become a source of general inquiry, and yield general pleasure, while the student will receive immense aid by the development of structures, the flow of fluids, and the ravages of organic decay.

The soldier, the agriculturist, the man of science, and the pathologist all derive pleasure and more accurate ideas; so the educationalist, and the students, and the young may have their aids to get the simple forms and language of knowledge and learning.

It is thus hoped that the means of acquiring knowledge may be greatly facilitated by the aid of photography, that a frequent reference to the beauty and the utility of common objects may be the means of conveying permanent and pleasant ideas in place of irksome weariness, and as the public generally are just being educated to observe the grandeur and glories in nature, and day by day to hail the advent of photographic examples, then frequent reference to nature's form and nature's own transcripts and photographic pictures will form a public so truly critical that the true teacher and true artist will find reward for their thoughts and time. The School Board and departments have done much to make accessible copies, ingenious combinations, to afford drawing practice to be followed with efficiency and zeal, and it cannot be doubted that while fine truths are taught to be selected and expressed, the rare genius may arise that from such beginning may give glorious indications of the painter's art, and day by day will surely be felt the aid photography can give to educational triumphs.

Notes.

Dr. J. M. Eder will shortly contribute a series of articles on "Light."

"Cash at the time of sitting, and how I get it." We have selected the papers of Mr. B. Rhodes, of Gloucester, and Mr. Laws, of Newcastle, on this subject, which will appear next week.

This time no less than six papers, some of them very good ones, were received the day after that fixed for sending them in for competition.

Since the Dundee Exhibition takes place shortly after the closing of that in Pall Mall, exhibitors will be able to send their pictures from one to the other, if it so please them.

Apropos of a detective camera. *Truth* says:—"Mr. Redpath, the American journalist, attended an eviction in West Cork last week, accompanied by a photographer, who took a photograph of the scene, copies of which Mr. Redpath intends to exhibit in America."

Touching our remarks upon the Abyssinian photographic equipment, a correspondent points out that its success was also due in a measure to Serjeant Harrold, R.E., who acted as chief photographer to the party. We are very glad to mention Serjeant Harrold's name once more in these columns, where special attention was drawn to his efficiency both during the Abyssinian war, and at its close. Serjeant Harrold's pictures of Magdala, of the public buildings, and King Theodore's Palace, his group-photographs of the European prisoners, missionaries, and workmen, are among the most interesting souvenirs of the campaign.

The chief photographer, we remember, told us an interesting anecdote connected with the storming of Magdala, to demonstrate in a conclusive manner how vastly superior were breech-loading rifles, then newly distributed to the army, to the old muzzle-loaders. Serjeant Harrold, exchanging his camera for a rifle, was one of the first to arrive before the Magdala gate. It was loop-holed, and the defenders were firing their long muskets through at the advancing Engineers. At every discharge, however, each defender had to withdraw his musket from the hole, in order to load and ram the charge home, and when this happened, a British soldier on the other side, seized the opportunity of thrusting in his own rifle. The enemy, after loading, waited patiently their opportunity again, eager for the withdrawal of a British rifle, so as to take their turn once more. But their turn never came. Once the breech-loading rifle was in position, there was no necessity to withdraw it, since the cartridges were poked in from the butt end; so the poor citizens gazed for a time at the fiery tubes emitting shot after shot, and then turned and fled. Our photographer said a more successful result could not have been secured with the new apparatus.

Goupil's photo-gravure process is justly deemed the most perfect of our mechanical methods. It is the Woodbury process elaborated by M. Rousselon, to whom the French Photographic Society awarded their gold medal. Next week we shall have the pleasure of presenting our readers with an illustration of this beautiful process, the subject being M. Dagnan-Bouveret's humorous painting, "A Wedding at the Photographer's."

Photography has not yet been able to supersede the eye in our observatories, and the consequence is that much laborious work has still to be undertaken by astronomers. At the Paris Observatory they are compiling a catalogue of the stars—a mighty task, truly—and during the past year no less than 70,000 observations have been tabulated by the ten busy astronomers engaged in the work. It would be well, indeed, if they could get the camera to help them in their weary duty.

The new observatory in the French capital is progressing. The rooms in the foundation, many feet under the earth, where the magnetic camera finds a place, are complete, and now the upper portion is to be taken in hand. Where the bar magnet swings which records the magnetic pulsation of the earth, it is necessary that the utmost quiet should prevail, and for this reason it is that deep cellarage is necessary in an observatory. In Paris the pulsations will be recorded by photography as at Kew and Greenwich. A tiny mirror carried by the magnet throws a beam of light upon a moving roll of sensitized paper; whenever the magnet vibrates, the mirror vibrates also, and a line more or less curved is produced upon the sensitive surface. Thus the strength of the magnetic disturbance, as well as its duration, is recorded by the watchful camera, whose glassy eye is for ever fixed day and night upon the magnet.

In Lucerne churchyard we recently saw several excellent examples of ceramic photography on monuments. With scarcely an exception, the photographs were let into tablets of polished black granite. They were portraits of the deceased on white porcelain, usually bust-pictures three or four inches high, in the shape of an oval medallion. We counted fifteen monuments thus fitted with photo-ceramics in the main square of the churchyard.

A new valise equipment, the invention of Surgeon-Major Oliver, is to be distributed throughout the army, and very soon the clumsy old military knapsack will be a thing of the past. The valise will be in two portions, one attached to the shoulders, and the other to the small of the back, and in order that there shall be strict uniformity throughout the regiments as to the manner of carrying the new equipment, every commanding officer is to receive a set of photographs of a soldier in marching order, properly accoutred. The pictures, taken from different points of view, will demonstrate at a glance the correct position of straps and buckles, and render elaborate printed regulations unnecessary.

We had the pleasure of inspecting the gelatino-chloride transparencies of Dr. Eder and Captain Pizzighelli at Vienna, which recently gained one of the highest awards at the Exhibition in that city. They are a magnificent collection, delicate and vigorous, and with tones of a most varied and pleasing nature. Any tint, apparently, from cold purple to crimson, may be secured, for we saw examples of a dozen different tones. The series proved, in a word, that gelatino-chloride has decidedly a future before it.

Dr. Eder is of opinion that a printing method may be evolved from gelatino-chloride which, while possessing all the beautiful attributes of our present silver process, may be free from the reproach of fading, a fault undoubtedly connected with the sulphur contained in albumen. Meanwhile, gelatino-chloride is to be heartily recommended for the preparation of transparencies and multiplication of negatives.

The account of the Marquis of Lorne's interesting tour through Canada is the only attractive reading just now in the papers. In a land where log houses are sixty miles apart, and communication so scanty that news from home only comes once a fortnight, we may take it for granted there is still much of the primeval about. From all accounts, it is a magnificent prairie and forest country, with its semi-Indian population. What a pity that the Viceroy's party, being so large, and including competent chroniclers and artists—Dr. Russell, of the *Times*, and Mr. Sydney Hall, of the *Graphic*, being of the number—should not have attached a single photographer, either amateur or professional! The Prince of Wales acted more wisely when he asked Mr. Francis Bedford to accompany him to the Holy Land; he brought home with him reminiscences indeed.

Topics of the Day.

WANTED, AN OPERATOR.

BY CLIFF.

It is astonishing what an unlimited stock of amusement can be got out of the advertising columns of the photographic papers. The number of advertisements, the variety of style, and the peculiarities of wording, are each in themselves a study. The qualifications of an operator seem to be very numerous, and, according to different advertisements, so do the qualifications differ. The following is a fair sample of a style which appears now and then: "Wanted, at once, a really first-class Operator and Retoucher; must be a thorough Christian and a total abstainer; to such the situation will be a permanency." Is not this style of advertisement a libel on the profession, and calculated to injure the members of it in the eyes of outsiders? It reads very much like a lawyer's speech. "I will not say that the witness belongs to a profession the vast majority of which are Atheists and notorious drunkards." There always seems to me to be very little difference between the two ways of putting it; each conveys a covert insinuation against the moral and religious character. Here is another style of advertisement materially differing from the former: "Wanted, a thoroughly first-class man as Operator and Retoucher to Open and Manage a Branch. None but really first-class men need apply. Salary 30s." Now, here are numerous qualifications required for the munificent salary of 30s. per week! In the first place, the operator must be *first-class*; that is to say, he must have had fifteen to twenty years' experience, have already used up the best part of his life, and be willing to use up the rest at the afore-mentioned "liberal" salary. He must, of course, be A1 at lighting and posing, and always secure good portraits of children. He must also be a good retoucher, or, in other words, be prepared to spend several hours a day in putting elaborate work on what must be already first-class negatives. Nor is this all: after he has done his day's work, and it is too late to take any more sitters, he must quietly sit himself down for a few hours more and make up his books, pack and send off the prints, and cast his balance sheet (in most branch businesses this is required to be done every day); then, when the rest of the people are in bed, he will perhaps be able to have his pipe, and dream of what he shall be able to do with all his salary when the long, laborious, week comes to an end.

How people in their senses can expect a man to be "first class" in even one of the multifarious qualifications for anything like the money goes beyond my comprehension. A man who has spent time, brains, and money enough to become a first-rate operator would not take the berth. So say we. But if such is the case, how is it that this style of advertisement is always cropping up?

Another thing has specially struck me with regard to advertisements for operators. It seems strange, very strange, that there should be so many advertisements in which we are to apply to initials at some library or at some other place where letters are "to be left till called for." When I was younger, and more innocent of the ways of this wicked world, I used to imagine that this was because the firm advertising had not yet given their operator notice, and didn't wish him to know they were looking out for a successor. After considering the matter and experimenting a little upon it, I have come to the decision that nine out of ten of these advertisements are swindles, put in by some third or fourth-rate man in want of specimens for his show-cases. Brother operators, take the advice of one who has been bitten, and don't send your best specimens till you know whom they are going to, or it is ten to one you don't see them again! I don't mean to imply that all "initial" advertisements are a swindle, neither do I say that all in which full name and address are given are genuine. Not long since, a photographer living in one of our university towns advertised for a "first-class operator," and a friend of mine, then in Ireland, replied, sending specimens. A fortnight passed, but the specimens didn't go back; he then wrote for them, but received no answer. Hearing that I was likely to be in the town, he asked me to call for them, which I did, and I found that some of them were being exhibited as work done in that studio, and asked for their return. The photographer in question regretted that he had been too busy to look them up and send them back, but if I would call to-morrow he would have them ready for me. I told him that I was sorry I could not do so, as I was going to London that evening, and he then promised faithfully to post them on. It is almost needless to state that neither my friend nor I have seen one of those specimens since.

On one occasion I received my specimens back bearing manifest marks of having been chewed at the corners by children, besides all being broken across the middle, and one or two of the best missing altogether. I would advise operators to write their name on the face of their specimens in ink or pencil, which would, in most cases, ensure their return, as very few photographers would have the audacity to exhibit them as their own work then.

I have heard of operators before now who have been expected to do every atom of the work in connection with the business. One friend of mine, in a berth not far from Kensington, had to clean his own plates, arrange matters with the sitters, varnish and retouch the negatives, print, tone, fix, wash, mount, spot, roll and pack up the cards; and even then hints were thrown out that he ought to take them home himself, and try to get fresh sitters by showing specimens about of an evening. All this was expected for a salary I am ashamed to mention. The great question arising from all this is—"Can an operator be reasonably expected to do first-class work when he has such a number of different duties to perform?" I am decidedly of opinion that he cannot, and that a business which is not large enough to employ at least an operator, a retoucher, and a printer, and where the proprietor cannot even send off the prints, or keep his own books, is not worth carrying on.

I have been told that, in one or two establishments in London and vicinity, the operator is expected to clean the studio windows, and that in one house—not a hundred miles from Cheapside—the retoucher is occasionally asked to fetch the proprietor's wife's lunch-beer. I trust these are only isolated cases. But one thing is clear, and that is this, that unless operators and other photographic assistants stand up for their rights, they will most assuredly be sat upon by *some* employers.

It is, of course, a fact that these employers of whom I have written are a minority, and that there are others who are the very reverse, and many who show the greatest consideration towards their employées, to whom they give a decent salary. Why could not a society be formed amongst photographic assistants for their mutual protection, in the same way as in other businesses? The worst of it is, that there are many young men—aye, and middle-aged men, too—who accept any berth that is offered to them, at almost any salary, not only to their own detriment, but to that of the profession in general. Let us all be alive to our own interests, and, while helping ourselves, we shall, perhaps, unwittingly help others.

The "Topic" next week will be, "Cash at the Time of Sitting, and How I Get It."

A NEW METHOD OF TAKING TRANSPARENT POSITIVES.

BY CAPTAIN BINY.

The inventor thus describes his method in the *Bulletin de la Societe Francaise*:

The necessary steps in this process may be shortly stated as follows:—(1) Take a good negative in the camera; (2) Develop it well, and intensifiy it so far as may be necessary; (3) It must not be fixed; (4) Expose it on a black ground to diffused daylight, in order that the silver salts not reduced in the negative may be acted on; (5) The positive image thus produced must not be at once developed; (6) But the now useless negative must be made to disappear by means of a transforming bath—that is, the silver completely reduced by the developers which have produced the negative—must be converted into compounds of silver, insoluble in pure water, but soluble in fixing solutions, like those of hyposulphite or cyanide; (7) The latent positive image produced by the action of the diffused daylight must now be made to appear by means of a bath, which is at the same time a developer and an intensifier; (8) Lastly, this positive must be fixed by dissolving out the re-combined silver salts of the original negative by means of hyposulphite or cyanide. If, in place of fixing the positive, as it is obtained after the seventh operation, it be successively treated as described under Nos. 4, 5, 6, and 7, it will be again transformed into a negative, and so on as before.

It should be here observed that, as regards the theory of this method, the principal point is the singular inaction of the transforming bath on the non-reduced salts of silver which form the whites of the negative. In fact, after the bath has destroyed all the dark parts of the negative, these salts retain completely the whole of the effect (is it physical or chemical?) impressed upon it by the action of the diffused light. At last, however, they are reduced, and then they fix the reduced silver introduced by the final developer which causes the positive to appear. The striking fact is, it may be repeated, that nitric acid, not alone, as stated by Mr. Sutton, but in combination with bromide, with chromates, with chromic acid, with permanganates, or with soluble bichlorides, will, after a sufficient exposure in a good light, transform negatives into positive pictures.

This being granted, we will now examine the three following cases:—1. Positive collodion plates taken from line drawings; 2. Positive plates on collodion with half-tones; 3. Positive plates on gelatino-bromide with half-tones.

1.—Plates Copied from Line Drawings.

For this purpose a pliable collodion must be employed; it must adhere well to the glass plate, which, if necessary, may be collodionized at the edges; it must be permeable to water and to the baths, must be fluid rather than thick, and must contain both chlorides and iodides. The plate must be well exposed in the camera, so as to yield a good negative with a slight over-exposure. It must be developed with iron, but not in the first instance too strongly. It must then be thoroughly washed in water, and again developed with pyrogallic acid, at first simple, and afterwards mixed with a few drops of a highly dilute solution of silver. When this development with pyrogallic acid threatens to destroy the fine lines of the negative, its action must be stopped. The plate must then again be washed with water by means of a rose, but not too violently, so that a trace of pyrogallic acid may still be left in the permeable film of collodion. In this condition it is placed on a raised flat surface, covered with black cloth, and exposed to diffused daylight, but not to the direct light of the sun, and left there from thirty to sixty seconds, according to the intensity of the light. If the variations in tint of the negative be observed during this exposure, it will be seen that the blackened and reddish grounds will not change colour, but that the bluish grey lines which have not been developed will gradually deepen in hue to a violet tone very perceptible against the deep brick red colour of the reduced silver which surrounds them. At this point the exposure must be discontinued, and the plate be taken into the dark-room, which should be illuminated through tolerably clear yellow glass panes.

Now place the plate in one or other of the following baths:—

1.	Water (by volume)	500
	Pure nitric acid	300
	Saturated solution of potassium bichromate	200
2.	Water (by volume)	500
	Pure nitric acid	300
	Pure chronic acid	20

and watch carefully the alteration which takes place. All the reduced silver will gradually pass again into the state of nitrate, which in the presence of the bichromate or of the chromic acid gives rise to a granular deposit of chromate of silver on the white opalesque surface of the ground of the transformed negative. This chromate of silver adheres tenaciously to some parts of the plate, but principally to the old negative lines of the drawing. It has a deep brick red colour, and shows the lines of the positive image which will presently be alone developed.

In order to remove the chromate of silver which adheres to the ground of the plate, a mixture of equal parts of nitric acid, alcohol, and saturated solution of potassium bichromate, well diluted with water, should be poured over it. It is then washed, and a dilute solution of pyrogallic acid is flowed over it. After the film is thoroughly impregnated with the acid, the excess is run into a beaker, and a few drops of silver solution added to it, and this intensifier is then again poured on the plate, which has already begun to assume a positive appearance by reflection. Gradually this appearance becomes more pronounced under the action of the mixture of pyrogallic acid and silver, and the positive image will show both by transmitted and reflected light. All the defects of the original will show, even the grain of the paper if it is the copy of a drawing or engraving; it is, therefore, important not to intensify too strongly. It may now be removed from the dark room, fixed with cyanide, and well washed. If necessary it may be still further intensified by mercury bichloride, and then by ammonia, or else again by pyrogallic acid and silver.

This process, if carried out strictly according to the instructions above given, is infallible; it sometimes gives fog in the ground parts if the original exposure has been insufficient, and particular attention must therefore be paid to this point. It is more difficult to employ it in taking portraits or landscapes, because the half-tones will be destroyed or be coated with too much silver by the action of the pyrogallic acid; but for copying line drawings it is simply perfection.

2.—Portraits or Subjects in Half-Tones.

A very granular and permeable collodion must be again used; but for this purpose it should contain a little chloride of zinc or of cadmium as well as the bromides. In taking the negative the exposure must not be too long, but still sufficient to produce all the half-tones on development. Develop with iron, and intensify to the utmost with iron and silver in the dark room. Do not wash the plate, but place it, coated as it is with iron, on a surface covered with a black cloth, and expose it to a strong diffused light. At the end of from ten to fifteen seconds, before any appreciable change has been effected in the plate, except the appearance of a slight violet tinge, take it again into the dark room, wash it, and then immerse it in the following bath:—

Water (by volume)	100
Pure nitric acid	25
Saturated solution of potassium bichromate ...	25
	150

So soon as the negative image has disappeared, remove the plate quickly from the bath, and wash it well under a rose, from which the water is discharged with some force. By this means all the chromate of silver that could be seen on the surface is washed away, and if some by any chance still remains, pour over the plate a mixture of nitric acid, alcohol and bichromate, which will soon clear the film.

The development with silver (very dilute) and iron must then be resumed; it must be conducted in a basin with the greatest care, and very gradually, so that the image may come out in all its delicacy. No pyrogallic acid should be used, as that would cause the tints to be crude and rough. Finally, it must be fixed with hyposulphite, and if necessary intensified with mercury bichloride; it must then be well washed, and afterwards immersed in a 20 per cent. solution of ammonia.

3.—Gelatino-Bromide Plates with Half-Tones.

As regards gelatine plates which are to express the half-tones, it may be stated at the outset that all the manipulation must be conducted very slowly, and without the least sign of haste, since bromized gelatine, when moist, is infinitely less permeable by the various reagents than collodion, even of the least granular kind. The operations (of which a list is given below) must, therefore, be carried out with the greatest patience.

1. The gelatino-bromide plate is exposed in the camera for just the right length of time to get a good negative, with all the half-tones well expressed. 2. It is developed with ferrous oxalate, in a dish having a black bottom (porcelain dishes, with white bottoms, fog the plate, even in a dark-room protected with ruby glass) until the dark parts of the negative can be seen beneath the film by looking through the back of the glass plate. 3. It is then rapidly washed underneath a small tap of rain-water—that is, water containing no salt of lime—in such a way as to leave much of the oxalate in the thickness of the gelatine film. 4. The plate is then placed on a flat surface covered with black cloth, and is exposed (wet as it is) to diffused light, or, if preferred, to the direct rays of the sun. 5. During the exposure the variations in tint of the plate must be carefully watched. In about two or three minutes all the tints will be seen to darken perceptibly through a violet to a brick-red. At the moment when the white spots at the corners of the plate—which are, in fact, the impressions of the rests of the dark-slide—turn a deep lilac colour, the action of the light should be stopped. Great attention must be paid to this point; for, if the exposure were continued longer than to produce this effect, the plate would become a mixture of negative and positive, another proof of the fact observed by M. Janssen that the salts of silver, by continued exposure, pass from the negative to the positive state, and *vice versa*. 6. Before, then, that any red tinge appears at the corners of the plate (no matter if it has dried complete during the exposure, with all its ferrous oxalate imprisoned in the gelatine), it is carried into the dark-room, and washed for a quarter-of-an-hour in a full stream of water, so as to wash out all the oxalate. 7. When it has been thoroughly washed, the plate is immersed in the following solution:—

Water (by volume)	100
Pure nitric acid	10
Saturated solution of potassium bichromate	30
Saturated solution of bromine	10
	150

Should there be any risk of the nitric acid dissolving the gelatine as sometimes happens, five parts instead of ten parts of that substance can be used; (8) When the plate is thus immersed, the negative image gradually vanishes, and then all of a sudden the positive image makes its appearance. The back of the gelatine film is then examined, by taking up the plate by one of its corners and looking through it, and the plate must not be withdrawn from the bath until all the details of the positive image can be seen both by reflected and transmitted light. If the right moment be seized, this image will have extraordinary vigour, and be most beautifully modelled. (9) The plate is next washed in a basin for at least half an hour by means of a continuous stream of water, until every trace of bichromate—which penetrates so readily into the depths of the film, and if left there, causes spots—has entirely disappeared. (10) If this has been properly effected—and we can easily satisfy ourselves on that point by opening the door of the dark-room a very little, and letting a ray of white light fall on the plate, when no portion of it should show any signs of a canary yellow colour—the positive image can be fixed by a 20 per cent. solution of hyposulphite. The image taken in this way has, in full day-light, a lilac verging on violet colour, like neutral silver bromide which has been over-exposed in bright sunlight. It is beautifully soft and velvety; but, unfortunately, has not always sufficient intensity. (11) To make it more intense, it may be dipped into a bath of mercury bichloride. After it has become completely whitened, it is washed for at least a quarter of an hour, in order to remove any excess of bichloride, and then plunged into a bath of ammonia of 20 per cent. This terminates the process for the positive on gelatine.

Up to the present we have not succeeded in intensifying the rather weak tones by a mixture of silver and iron or pyrogallic acid; but it will be confessed that in the condition that we now are able to get them, these direct positives are excellently well adapted for enlargements. We hope, however, that this paper may lead some of our skilful operators to discover a powerful intensifier, by aid of which they may be able to obtain with certainty positives with half-tones softer and less harsh than those which we get by using pyrogallic acid and silver on impressions of line drawings. The latter we are taking in our own studio for the *topogravure* process, or method of printing on zinc, recently invented by M. Noë, Commandant of Engineers.

A DAY'S RIDE.

BY GEORGE BRADFORDE.

"COMING HOME."

WHEN entering Bray from the Inneskerry road, one is not delighted with this Irish "Brighton." Shell cottages, wooden huts, fields covered with mortar and rubble for building, dilapidated factories on the banks of the Dargle—all go to make up a very unpleasant picture. It is only when you cross the bridge, get a glimpse of the busy High Street, and jog along past the mighty mansions of the great, and so on to the Esplanade, that you become aware of the fact that you are in the midst of health and wealth and of beauty—natural, nautical, and feminine. When this throng of "lords and ladies gay" burst upon my astonished gaze, I looked eagerly around; and, by heavens! I soon found what I looked for. There they were with their banjos, their bones, their huge collars, their striped vestments, and their black faces. Bray, "Boycotting," evictions, and dynamite faded from my mind, and I was in dear old England again, watching for the little figure—that I knew would be there—from the bridge of the *Husband's Boat.* Something like a tear dimmed my eye at the happy remembrance; but soon the ideal gave way to the practical or substantial. I'll back my olfactory organs against any man in the three kingdoms for smelling out a good dinner. Thus it was that I struck a bee line for the dining-room of the Bray Head Hotel.

Good dinners are mighty fine bits of philosophy. Carlyle called his stomach "a diabolical machine;" so it is when you have nothing to put in it. I remember having a sitter once who said, "Now, do be smart! My dinner will be ready in fifteen minutes, and I can't bear it cold." The expression of that man's face was so angry and fiendish when I was about to expose my plate, that I exclaimed, "Go home, sir, and after you have had your dinner return; when I feel certain that I shall obtain a happy picture of you." He went; and when he came back, church bells nor field ordnance would have made him keep his eyes open. Thus it was with me. I intended to secure a picture of Bray, north and south; but felt so much at peace with all mankind, that it was at a small village called Crinken where I exposed the next plate. There is beautiful foliage to be got here. The trees are really wonderful (the trunks of some of them being enormous), putting one in remembrance of Dunkeld and the Duke of Athol's giant firs, and the immense piece of timber where Neil Gow sat and composed his famous "Fareweel to Whiskey." What a wonderful amount of detail you can get of a dark subject with a dry plate—the brackens in the deep shadows showing every grain and leaflet! Still, I must have another grumble at the thick and the thin end of the plate. To the eye looking through it—in some cases—it is hardly perceptible; but, when printed, it is very aggravating to find one end right, and the other only half done. Certainly, this can be remedied in the printing; but when you have a disobliging printer, who considers it a crime to give him anything but plain work to do—work such as anybody of average merit could do—you must think what you are about.

And now we leave Crinken and jog along past Shank-Hill. I was nearly making a mistake here. We came to a grand royal-looking building, and I felt sure that it belonged to some wealthy land-owner. I told Andy Flinn to draw up, and commenced to dislocate the tripod, when Andy, his eyes opened in amazement, exclaimed, "Sure, ye's not going to take the *Union*, is you, sor?" I located the tripod, clambered up in my seat, and laconically answered, "Drive on!" There was a snigger—a smothered snigger—but I could not tell whether it came from my better-half or A. Flinn. However, my next plate was a great success. It was the village of Loughlinstown: the funniest place ever I saw. The houses are all at sixes and sevens, if I may use the phrase; they are built in something like an old sand-pit or quarry-hole, and give a stranger the impression that they had been dropped from the clouds and remained where they fell, a gavel showing in one, the back and ash-pit in another, the front with its honeysuckle and rosebush in a third, while you behold one or two pitched upon the very tip of the bank at most painful angles. Here I secured a couple of very decent negatives. After this I did not expose another plate.

But let me tell you my experience of the road. Every quarter-of-a-mile you passed a priest, or a priest passed you. Then, to vary the monotony, a beggar—male or female—stood in your way, and ran after you, pouring blessings and curses all in one breath. At length we came to Black Rock, and at this remarkable village all our enjoyment ended. Andy Flinn had clambered up the scalp rocks at Inneskerry, and obtained a whole budget of beautiful fern roots for Mrs. B. For better security, she placed them on the car side that belonged to me. When we came to this miserable place, the foul fiend hunger prompted us to go to a hotel, and order sandwiches. They came; and, after five minutes passed in futile attempts trying to masticate them, I went forth for Andy, and benevolently bestowed them upon him. He tried them for fifteen minutes, and then, after a long sigh, gave it as his private opinion that they were of "home manufactory." We then silently sought the car, there to find that the honest folks of Black Rock had taken the advantage of Andy's absence to abstract the best of the fern roots.

In a very short time we were rolling along the lanes of Sandymount and Irish Town, and safely arrived at home. After having been congratulated upon such a jolly "day's ride," I was amazed to hear the youngster set up a most hideous yell; the more we tried to sooth him, the worse he got. Bo-hoo!—Bo-hoo! "Do tell your dear mammy what its darling wants?" asked my better half, in that maudlin strain used to spoilt children. "I'sh wantsh to drive out adain to-morrowish!" sobbed the little man. I could not help echoing his sentiment, I had enjoyed myself so much.

GREEN FOG.

BY A. J. BROWN.*

THE week after Mr. Henderson started these meetings, I made an emulsion and converted it into pellicle, which for several causes was put away in a gutta-percha bottle until last week. When I took out the cork it smelt mouldy, and it was clear I had not properly dried the pellicle. I expected capital green fog. I coated some plates for experiment, and got what I expected. I have used several dozen plates in these trials. I have found that although it is supposed to be due to the decomposed gelatine, there is a deposit even in the deepest shadows, so that the presence of the silver salt is necessary; for if a plate be thoroughly fixed and washed without exposure, I cannot get any deposit by soaking in the developer and then immersing in hyposulphite, but the fog is there in all its beauty without any exposure to light, if developed for it. I say developed for it, because you need not have it unless you like. The cause is in the alkaline developer; the ammonia and hyposulphite alone will not give it, and yet it appears it depends on the ammonia for its existence. If there is an acid pyrogallic developer—I do not know if there is, for I have not very long dabbled in the craft of the dirty hand—and you can use it for gelatino-bromide plates, I should expect green fog would not appear. By using ferrous oxalate, you steer clear of this abomination. Why? I think because it is acid; all the samples of neutral oxalate I have bought are acid, and those I have prepared myself I have purposely made so.

While speaking of this developer, I must say I am surprised that photographers take so unkindly to it; it has everything in its favour; it is cheaper, cleaner, and has all the range of pyrogallic if you know how to use it; the prints are brighter, print quicker, and the colour is nearer that of the retouching pencil than the pyrogallic; any amount of density may be got, and, I believe, the negative will be found to be more permanent. It can only be, I think, because it has not had a fair trial. I believe the development of the future will be a brush with a camel-hair pencil or two, a strong solution, a weaker one, and one well restrained with bromide, before you, you may bring up your negatives as you may wish, the quantity of solution used being very small.

---

* Read at Thursday Evenings for Photographers.

To return to "green fog," if the plate be fixed with cyanide of potassium, the deposit in the shadows is not so marked; the dissolving power of the cyanide is certainly stronger here than in the high lights. I think this may give the key to the cause. I would suggest that the gelatine is in such a state as to induce a very fine deposit all over the plate, the particles of silver being smaller than those due to ordinary development in a healthy plate, and these are sooner acted on by the cyanide, and to a greater extent than those due to the true development upon those parts of the plate acted upon by light; thus by restraining the developer and giving good exposure the attraction is strong, and they are deposited where they should be, instead of all over the plate; and this is the green fog cure: simply give a long exposure, two, three, or four times normal, and use a selected developer—that is, plenty of bromide and as little ammonia as possible. This is a cure—in some cases only a partial one—for other kinds of fog. You may almost play with a slow plate; but a rapid one requires care, for very great sensitiveness is only got on the border land of fog. "The development, the development's the thing, Horatio."

Correspondence.

A COMPLAINT FROM INDIA.

Dear Sir,—There have been several complaints in your paper lately—some from India—of the difficulties that exist, or are, apparently, made to exist, by dealers in photographic materials when executing orders. I am sure all amateur photographers, particularly those who, like myself, hold good a valuable kit, would be much obliged if you could mention and recommend some firms to whom we could go with our orders, feeling that they would do their best for us both in quality and speed.

I placed an order of £60 with a large firm well-known to all photographers, and sent them the money with the order. This is how they treated me with my first order, as an encouragement, I suppose, to try them again.

I ordered, and the firm *invoiced*, a camera with a *hinged* focussing screen: the camera arrived with a *sliding* screen.

A second single dark slide came with the camera, and though I had *seven* inner frames sent out, only one, the C.D.V., fits the slide. I presume it was the duty of the firm to have fitted the frames to the slide before despatching it to me.

I ordered, and they *invoiced*, "*one* dozen oval and other shaped masks, 8½ by 6½." I received *three* dozen all oval. Whenever shall I use all thirty-six?

I ordered, and they *invoiced*, a quarter-plate, twelve grooved light-tight boxes for dry plates with "India-rubber cushions." The box arrived without a particle of India-rubber about it, and is not light-tight, as I have discovered to my cost. Five quires of paper came out differing in colours from order and *invoice*, and of an inferior description compared to what I had by me, and much crushed in the putting up.

There are several other trifling matters; but I will not trespass on your space and time. On the whole, I consider I am perfectly justified in saying that I have never had an order treated with such delay, and gross carelessness, and indifference before. I certainly won't give this firm the opportunity of treating me again in a similar way, or any of my friends who may be intending to place their orders with them.

I shall be obliged if you can give this "complaint from India" insertion in your paper, for we out here require a little protection, as those who receive value of orders entrusted to them beforehand have us at their mercy; and when you can get nothing from them in satisfaction barring an empty regret, if so much, they ought to be named.—Yours faithfully, George Breithaupt.

PHOTOGRAPHIC SOCIETY FOR CARDIFF.

Dear Sir,—In reply to "J. J. M.'s" letter in your last issue, I should be glad to hear from him, in view of forming an Amateur Photographic Society for Cardiff and neighbourhood.—I am, yours truly, W. H. Kitchin.

Sussex House, Oakfield Street, Cardiff.

LUMINOUS PAINT FOR TRANSPARENCIES.

Dear Sir,—I was very glad to read Mr. Vincent's paper in last week's News. I did not know that he had suggested it before, but I have used it now for some time, and I was going to write to you how satisfactory I find it. Of course, you cannot tell how sensitive your luminous paint is to a degree, for the brighter the light to which it is exposed, the brighter will be the luminous surface afterwards. But I agree with him that it is better to "bide a wee" after the paint is withdrawn from the daylight. Exposures are then much more under control, and although it takes a little longer to expose, this does not matter.

I purchased the paint ready mixed, or, rather, a friend of mine did, who wanted to follow Mr. Warnerke's example, and paint the name of his house so that it was visible at night-time; in this state it contains turpentine, which I think rather detracts from its luminous properties.—Yours truly, Alfred Richards.

BALLOON PHOTOGRAPHY.

Sir,—I am desired by the President and Council of the Balloon Society to state that arrangements have been made for a special balloon ascent on the 15th of October, from the Alexandra Palace, with a view, if possible, of taking photographs of London from the car. I shall be happy to furnish any of your subscribers bringing a camera with a ticket of admission to the grounds.—Faithfully yours,

A. Standing, Hon. Sec.

26, *Budge Row, Cannon Street, London E.C., Oct. 4th*, 1881.

INTENSIFICATION OF GELATINE NEGATIVES.

Sir,—I have been trying to intensify some 10 by 12 gelatino-bromide plates by the bichromate process of Dr. Eder and Captain Pizzighelli, given in the News, p. 183, but have entirely failed to get rid of the deep orange colour imparted by the bichromate, and consequently the plates—being subjects of considerable value—are all but worthless in their present state. The plates were developed by the usual pyrogallic method, soaked in the alum bath, and intensified with a saturated solution of bichloride of mercury, followed by ammonia (1 dram to 1 oz. of water); then dried, soaked in a 3 per cent. solution of bichromate of potassium—dried—exposed to light in the prescribed way, and washed for many hours. No amount of washing seemed to have much effect in discharging the orange colour, although they were not quite so dark in the colour as at first. They were subsequently treated with the usual pyrogallic and silver intensifier for wet plates, which increased the dark colour very much. In order to get rid of this, I tried soaking in water pretty strongly acidified with hydrochloric acid, which, unfortunately, had the effect of lifting the film entirely off the plate, and ruining a valuable negative. After this result I am afraid to risk the others. Could any correspondent suggest to me any way in which I could get rid of the dark colour referred to?—I am, sir, yours faithfully, J. S.

Proceedings of Societies.

Thursday Evenings for Photographers.

At the meeting held on the 29th inst., the chair being occupied by Mr. A. L. Haddon, Mr. A. J. Brown contributed some remarks on "Green Fog" (see p. 478).

Mr. W. E. Debenham said he found that a little green fog was not injurious to the quality of the plate.

A negative taken by Mr. Henderson was passed round; only one half of the plate had been exposed, and on development the unexposed portion was found to be badly fogged, but the exposed half was quite clear of fog.

Mr. Ashman said that Mr. C. Bennett attributes green fog to the application of too much heat during the cooking process.

Mr. Cowan said he had developed plates with the usual quantities of bromide and ammonia, and got plenty of green fog; but by using double the quantity of bromide and half the ammonia, he got good negatives from other plates of the same batch.

Mr. A. L. Haddon asked Mr. Brown if he had observed whether green fog still existed after the image had been removed, dissolving it out with cyanide of potassium or hyposulphite of soda, having previously treated it with bichromate of potash and hydrochloric acid.

Mr. Brown said he had never made the experiment.

Mr. Debenham thought that the fog would be dissolved out at the same time as the image.

Mr. W. Cobb said he had observed green fog in plates coated with an emulsion prepared in an acid state.

Mr. Burton had noticed that when the glass had been cleaned with acid and imperfectly washed, that wherever there was a trace of the acid, there would also be green fog.

Mr. Brown said he had tried the plan of soaking the plates, previous to exposure, in free nitrate of silver, as recommended in the journals some time back. He found that the rapidity of the plate was increased about two or three times thereby, there is no fog, and the plates will keep four or five days after being so treated.

Mr. Burton asked if any one had had experience with emulsions containing iodides; he found them slower than bromide emulsions.

Mr. Debenham had had the same experience.

Mr. Henderson exhibited two pieces of gelatine—the first had been placed for two minutes in the pyrogallic and ammonia developing solution, and then well washed, and was of a deep brown colour; the second piece had been treated in the same manner, except that it had been placed in a solution of hyposulphite previous to washing, and was not so much discoloured. He said he found that bromides and anti-tanning agents will, to a great extent, prevent the discolouration.

Talk in the Studio.

The Society of Arts.—The secretary of this institution, Mr. H. T. Wood, has recently fitted up an exceedingly convenient preparation room for the use of those who have occasion to lecture or demonstrate in the theatre of the establishment, and a large photographic developing room, furnished with all the usual requirements, is also provided. A strong vice is to be seen firmly fixed to the main bench of the preparation room, and we may safely predict that many lecturers will appreciate the thoughtfulness of Mr. Wood in providing this useful appliance. The gas and water arrangements in the large lecture theatre have been much improved of late; several other improvements having also been made to facilitate the work of the demonstrating lecturer. It may be noted here that the exhibition of photographic appliances which the secratary of the society proposes to open after Christmas appears likely to be a notable success. We are told that original pieces of apparatus, as constructed by the inventors, will be especially acceptable; as also any specimens illustrative of old or unusual photographic processes.

Electric Exhibition at the Crystal Palace.—The second of the series of International Exhibitions at the Crystal Palace, inaugurated this summer by H.R.H. the Duke of Connaught, will be an electric exhibition. It is intended that this exhibition shall be opened in December, and remain open several months. Nearly all the systems of electric lighting will be represented at the Crystal Palace, so that the manufacturers, theatrical managers, and others who are thinking of applying electric lighting to their factories, warehouses, and theatres will have an opportunity of comparing the various electric lights. The winter is the best time for an electric exhibition, as the season will allow of the lights being seen from about four p.m. In addition to the many and various systems of electric lights, Mr. Edison will have a complete exhibit of his numerous inventions; telephones in their various forms will be strongly represented. Faure's and De Meriteur's secondary batteries, and Trouvé's boats, and many other scientific exhibits, will render this exhibition interesting to the public. An honorary council of scientific and influential gentlemen is now being formed to advise and aid the directors in the undertaking.

Portraits on Season Tickets.—The railway authorities in France have excited considerable hostile comment by requesting season-ticket holders to furnish their photographs, to prevent persons using tickets which do not belong to them. Why do not all railways adopt the system invented by the Russian General Staff for correspondents' passes during the late war in Turkey? Each representative of the Press was required to furnish three copies of his photograph. Upon the back of one of them was written his permission to accompany the army; the others were deposited where they might be useful for identification in case the pass was lost. Railway tickets could easily be printed on the back of a photograph of the holder, and in this way there never would be any question of identity which a moment's inspection would not solve.—*Truth*.

To Correspondents.

*** A cheque for two guineas will be paid for the best practical article on "Photographic Residues and Waste; What is worth saving, and how I save it." The name of the author need not appear. For rules, see previous numbers of News. Contributions must reach this Office by the 1st November.

John Stone.—The manufacturers of the article sell a special preparation for the purpose.

J. McK.—1. It is very well adapted for the use in question. 2. More than twelve hours. 3. From any dealer in photographic materials.

F. R. S. -1. A wide angle rectilinear or symmetrical lens is most suitable. 2. Raise the front of the camera; you will probably find it unnecessary to use the swing back. 3. "Good light" and "absolute safety" are contrary to each other; and you must hit on a mean between them. 4. The former contains 7,000 grains, while the latter contains but 5,760 grains. In referring to a pound, we should generally mean the former, and probably most photographic writers would do the same. 5. When alcohol is specified it is well to exercise a little judgment as to whether methylated alcohol will serve. If the power of judging is absent, the individual should use the pure article at first, and try afterwards if it can be replaced by the cheaper spirit. 5. Rather too long a table to insert in this column.

A. B. C.—1. Probably it is fair value for the money. 2. Consult "Silver Printing" by H. P. Robinson and Captain Abney. 3. We have used it very successfully, and should regard it as more suitable for you than a burnisher would be. 4. Flatted. 5. Slate colour.

Copyright.—It refers to the sale, or use for any purposes of profit; and it makes no difference whether the copy is made by hand or by photography.

D. M.—Thin glue to which one per cent. of carbolic acid has been added answers admirably.

R. B. G.—1. You will find the action to be so extremely slow as to render the method impracticable, it being highly probable that a general insolubility of the tissue would set in before a sufficiently vigorous latent image could be produced. The arrangement you figure would answer well for enlarging on a wet collodion plate or on gelatino-bromide paper. 2. The apparatus appears to possess many points of excellence and novelty, and we shall be glad to receive a detailed description with diagrams.

Doubtful.—Send us the paper, by all means, it being a subject replete with interest.

Dark Studio.—We are afraid that you will find it difficult to obtain any legal remedy, as you have not acquired a right by reason of long uninterrupted enjoyment. It is extremely probable that the neighbour who has built the obstructing wall would allow you to whitewash that portion which faces your studio, and this would make more difference than many would think.

Enquirer (Manchester).—We think that an article which appears in our present number will afford you all the information you require; if not, write again.

Samuel Leverson.—Merely another name for the Collotype Process.

M. A. M.—It is difficult to see a remedy for such a state of things, each party distrusting the other. If you yourself are "A," as we suspect, you would do well not to insist on your strict rights as regards the commission, and to waive the trifling claim arising out of the glass transaction.

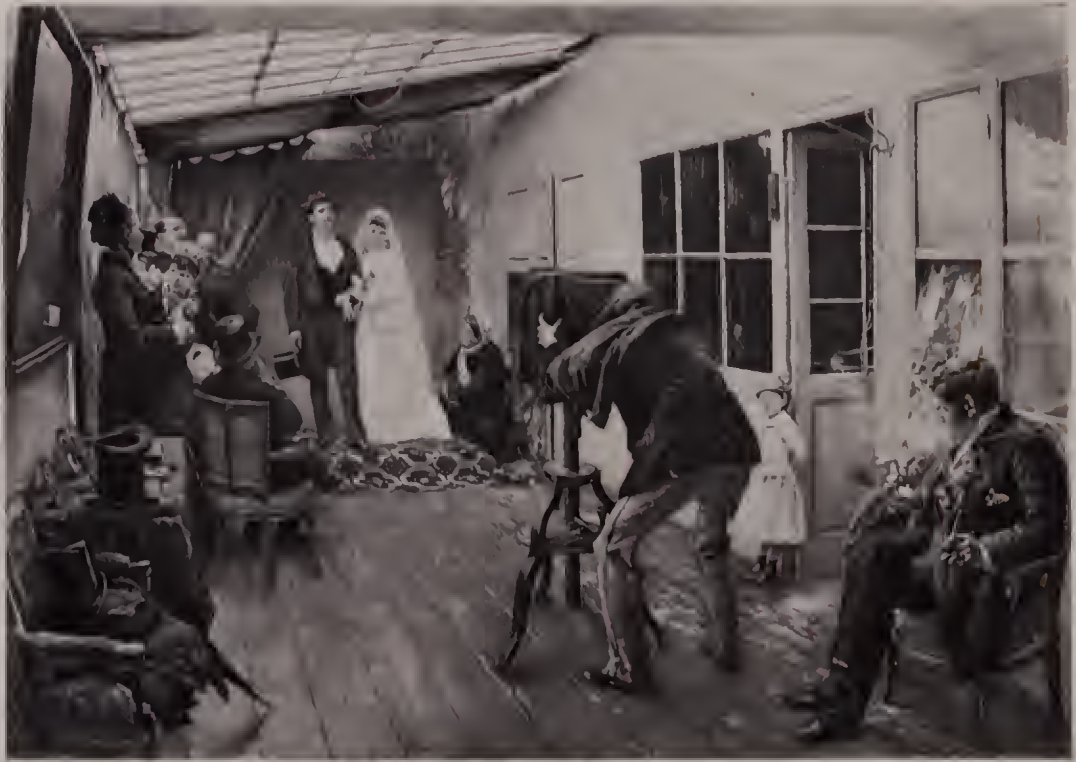
John Bennet.—The chloride is readily soluble in ammonia, while the iodide is practically insoluble, and the bromide nearly so. You must bear in mind, however, that absolute insolubility is not known, such salts as barium sulphate being soluble to a measurable extent.

PATENT OFFICE LIBRARY

Foot Accs 14.10.57

SUPPLEMENT OF THE PHOTOGRAPHIC NEWS

[illegible]



[illegible]

Photogravure Goupil & Cie

UNE NOCE CHEZ LE PHOTOGRAPHE

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1206.—October 14, 1881.

CONTENTS.

	PAGE
Our Illustration	481
The Photographic Exhibition	481
Electric Light in the Studio	483
Ferrous-Oxalo-Citrate Developer. By Captain W. de W. Abney, R.E., F.R.S.	483
Reviews	484
An Electricity-Lit Theatre	484
Reproduction of Negatives for Single Transfer Carbon Printing. By W. T. Wilkinson	485
Notes	486
Topics of the Day.—Cash at the Time of Sitting, and How I Get It	487
Some Experiences of Dry Plates. By William Harding Warner	488
Correspondence	489
Proceedings of Societies	489
Talk in the Studio	492
To Correspondents	492

OUR ILLUSTRATION.

We present our readers this week with an example of Goupil's photo-gravure process. It is the Woodburytype method adapted to engraving by M. Rousselon, the well-known manager of MM. Goupil et Cie. M. Rousselon's skill and ingenuity have been recognised by the French Photographic Society, which conferred their gold medal upon him; while the circumstance that it is the only true engraving process connected with photography which has firmly established itself in the commercial world—for the results of Klic, of Vienna, beautiful as they are, can scarcely be regarded as every-day work—speaks more eloquently still of its great value.

There is little need to refer in detail to M. Dagnan Bouveret's excellent picture, "A Wedding at the Photographer's." It is an exquisite bit of French life. The bridegroom, though apparently in humble circumstances, is attired *de rigeur* in a dress coat, and makes no disguise about being proud of his position; the bride, too, is enjoying to the full her newly-acquired dignity, and graciously permits mamma to smoothen the folds of the bridal attire without a murmur. Papa has taken up a position where he can sternly approve or disapprove of the photographer's arrangements, while the relationship of the other friends—the young man smoking is evidently best man—can be guessed without difficulty. The appointments of the modest little studio are very well considered, and we should not be surprised to hear that M. Dagnan painted his picture on the basis of a photograph, so realistic is it in its details.

THE PHOTOGRAPHIC EXHIBITION.

Whether the present collection of pictures in Pall Mall is better or worse than former displays, we cannot say; but it is very certain the Exhibition is a good one. It would have been better still if one-third of the pictures had not been hung, not because they were not worth hanging—for, in truth, there is very little bad work at all—but for the simple reason that there is not space enough to do justice to all of them. Of what use is it to fix up a ten-inch picture twice as high as your head?—or to place tiny frames, and big ones, too, for that matter, close against the floor? The Hanging Committee, trying to please everybody, run the risk of pleasing nobody. Their object this year, and from a very kindly motive, no doubt, evidently has been to hang everything that came; and they have done it. But we say, and say so, too, without fear of contradiction, they would have given more pleasure and greater satisfaction had they made a selection of the pictures, and given these fair play. There is no need to reject good contributions; but, on the the other hand, there is no reason why even the best photographer in the world should have twenty pictures exhibited because he chooses to send that number. Many a deserving photograph has this year been "floored" or "skied," that deserved a better fate; and more heart-burning will be caused on this account than if the work had been rejected altogether.

It may be argued that the gentlemen upon whom the thankless task of hanging devolves are helpless in the matter. Photographers cannot be made to send in their work in time, and, for this reason, the hanging simply resolves itself into a work of progress. We reply, the Committee have it in their own hands. Let them be firm, and not accept so much as a single album-portrait after the fixed time, and much of the difficulty will disappear. Some years ago the rule was made hard and fast, and it is a pity indeed there should have been any relaxation of it.

To come to a consideration of exhibitors and exhibits; eight medals have been awarded by the Committee, and since there were but eight to have, we think they have been distributed with much fairness. Whymper's magnificent views among the Andes of Ecuador are not only good pictures, but, from a scientific point of view are unique, since they illustrate and bear out several new points which that explorer recently placed before the Royal Geographical Society, and which points would not have been so readily entertained but for the proof positive, if the old pun may be forgiven, which Mr. Whymper was enabled to furnish. Travellers tell strange stories, and the stories told by Mr. Whymper, who has placed his foot on a higher peak than any mortal man yet—just as the esteemed President of the Photographic Society enjoys the distinction with Mr. Coxwell of having been higher into the heavens than any other human being—Mr. Whymper's stories, we say, would hardly have gained credence, but for the records he has brought home with him. "Look here! my camera saw them as well," he might say to a sceptic, speaking of the lofty ice walls of the Chimborazo (539), which indicate the thickness of the ice-crust that caps the summit, just as in an iced cake we can see the thickness of the iceing from a fracture. Doubts, it seems, have been expressed by geographers about the existence of glaciers at all on the Chimborazo; but members of the Geographical Society who see this photograph—one of many—will doubt it no longer. That it was taken 18,500 feet above the level of the sea—higher than any photograph yet—is some proof of Mr. Whymper's pluck and endurance as traveller and photographer; and we shall not be alone in regretting the Award Committee did not see fit to confer honour upon the Photographic Society, as well as upon the most intrepid mountain explorer of our age, by granting a medal. In justice, however, to those gentlemen, we may say, it is about the only regret we have in connection with the judgment.

The medals are awarded to the following gentlemen, taking the names in alphabetical order:—Messrs. William Bedford, J. T. Dixon., William England, J. Gale, Abel Lewis, H. P. Robinson, T. G. Whaite, and Matthew Whiting. We do not know if all the judges were present to give their vote, but the Society were indeed happy to have the assistance of two such famous painters as Mr. Philip Calderon, R.A., and Mr. George Leslie, R.A, the former acting on behalf of Mr. Herkomer.

Mr. H. P. Robinson's pictures are likely to attract considerable atttenion this year. To the landscape photographer Mr. Robinson unites the rare quality of an artist who is able to impart animation to his pictures; he not only produces a charming sketch from nature, but heightens the effect by thoughtful composition. In this way he secures a double interest. The medal has been given for "The Old Boat" (267), and has been given wisely and well. In the background is a park-like slope and a placid pool, the very emblems of sweet repose. An old boat lies high and dry on the shore, and beside it, resting for a moment, are two girls. It is just the place for a quiet chat, for the exchange of confidences; and while the lesser—a dainty maiden of thirteen—speaks under her breath, the elder girl turns her comely face towards us. What is her little companion saying that interests the village beauty, and brings out those smiling dimples? It is so very pleasant it must be about herself, surely. We should not wonder if the little companion has been asked to repeat the story over again; it looks like it, in the picture. How happy the swain, if he but knew!

"Her Ancestor" (270) is a fine oak interior, the light dress of the lady contrasting vigorously with the dark panelling of the walls. The motive of the picture is very telling; the fair one looks up at a grim painting, in the endeavour, no doubt, to think of him as when, full of life and breath, he trod the very room in which she now stands. Of all Mr. Robinson's pictures, this was probably the most difficult of execution, by reason of the contrast of light and shade. But there is still one other we must speak of before passing on; its title is, "Can I jump it?" (268)—a bright country lass about to clear the brook and brambles before her. A large flapping sun-bonnet frames her laughing face to perfection; she wears a striped petticoat, and, with quaint conceit, has tied a loose handkerchief coquettishly across her bosom. Of course she can jump it, and would do so quickly enough if you dared venture to help her. She is looking round simply to lure you on, in the hope you may make a fool of yourself. "Trust her not, she's fooling thee!" The dell Mr. Robinson has chosen for this dainty study, with its ivy boughs and crisp leaves above the clear brooklet, is in keeping with the little fairy on the brink.

Mr. Dixon earns his medal with a frame of magnificent animal studies (233). One of the most successful is his rhinoceros, the massive ponderosity of the beast being startling in its truth. It seems almost heaving with life. The bison is another good study; its pose is almost elegant, the animal is so finely poised. The zebra is, again, the perfection of photography. The care and perseverance that must have been exercised, to say nothing of the photographic skill, in the production of this series have their reward in these triumphs, which are even an improvement, we think, on Mr. Dixon's "Lions and Tigers."

Mr. Gale's masterpiece, according to the judges, is a tiny winter sketch (104)—a deer park in the snow and rime. Two magnificent trees are in the foreground; their solid black trunks, in delightful contrast with the delicate twigs all encrusted with silvery frost, are exquisitely limned. Ruskin has said that to admire nature's grand handiwork in our trees, these must be seen in winter, when the fine lines of bough and twig are perceptible; and Mr. Gale's picture seems to have been taken in illustration of this dictum. The red deer in the distance impart life to a marvellously good bit of photography. Mr. Gale is very strong this year, exhibiting no less than twenty-two prints; they are all well-finished cabinet pictures, and the views of sea-life are particularly attractive.

Mr. Matthew Whiting's name among the medallists will be welcomed by all. One of our earliest dry plate workers, his pictures are always executed with care, and frequently with much taste. There is only one frame (26) containing a dozen pictures. One of the pictures, "Off Dover," is our favourite, a vessel with her brown sails set, bearing down upon us, the craft between us and the bright sunlight. The shadows on the sails, while rich and vigorous, have still plenty of detail, while the vessel casts a brown shadow upon the waves in front which is really a triumph of art. To accomplish such a *tour de force*—the camera facing straight to the light—must indeed have been difficult, and we compliment Mr. Whiting no less on his success as on his pluck in attempting it.

Mr. Abel Lewis deserves a better place for his pictures than he has secured. His medal picture (571), by no means the best to our thinking, is a harbour scene, the granite quay in the foreground, and the pierhead across the water, being something more than clearly and sharply depicted; so soft is the detail and so harmonious the colouring, indeed, that it looks like a painting, a lazy vessel, setting her sails as she goes, adding still further to the pictorial beauty. The other harbour scenes that Mr. Lewis exhibits are all endowed with the same artistic taste, and will be found well worthy of study, both as examples of camera work and of fine printing.

Mr. William England's series (3—20) of alpine pictures are the same, or nearly the same, as he exhibited, and we noticed, last year at Bristol. That he has secured a medal for them is but a matter of course, and it is inexplicable why Bristol did not mark its sense of their beauty. The snowy Matterhorn, with the Riffel in deep shadow beside it, is an excellent sample of Mr. England's tasteful work, while an example of "clouds and view at one exposure' may be cited as the fulfilment of one of the most difficult problems in photography. As a rule, the attempt usually results in "clouds and midnight" at one exposure. The pass of the Tête Noire, with its lofty black pines, familiar to every tourist, and the Mont Blanc range, taken from the sole of the valley, a mass of ice crystals sweeping down into the dark foliage, are two of the finest in Mr. England's Alpine series.

Mr. William Bedford's pictures, which are in the vicinity of the last, exhibit many phases of leafy England at its best, two being especially good, the "View on the Monnow" (38) and "The Mill" (41). The placid water and soft foliage are here rendered to perfection, while the hazy distance is managed with the harmony of a skilled water-colour painter. In 38, everyone will admire the deep shadow thrown across the stream by a spreading bough, whose luxuriant foliage is a special feature of the picture.

Mr. Whaite takes a medal for the same class of studies that brought his name to the fore last year. But this time he has gone out of doors, and with no less success. "A Stormy Day on the Coast" (283), a group of donkeys standing with their heads to the breeze, is a capital picture. It reminds one of the painting, "Heigho! the wind and the rain." The donkeys are painted—we mean photographed—exactly the proper colour, and as they stand there alone and forlorn, tails between their legs, the wind and rain gusts can well be taken on trust. Some of Mr. Whaite's French market scenes are no less successful.

We must here defer our remarks, merely premising that there are among the other exhibits certain pictures quite equal to some we have mentioned, and to which we hope to do justice next week. Among the exhibitors may be mentioned the Autotype Company, Woodbury Company, Platinotype Company, the School of Military Engineering, Captain Abney, Messrs. Adams and Stilliard, Adcock, Alder, Andrea, Annan, Axtman, Beasley, Benison, Berkeley, Berryman, Bird, Briggs, Brown, Brownrigg,

Buxton, Byrne, Chaffin, Chilton, Cobb, Cocking, Conway, Cowell, Crouch, Croydon, Daniel, Darwin, Day, Debenham, Dixon, Donal, Donkin, Duncuft, Dunmore, Earp, Faulkner, Fincham, Fox, Gladstone, Gillard, Glossop, Green, Hon. Mrs. Hambrough, Messrs. Harding, Harris, Professor Hartley, Messrs. Harrington, Heath, Hendrey, Hill, Hilditch, Hills and Saunders, Horsey, Hubbard, Dr. W. Huggins, Messrs. Hunter and Sands, Keene, King, Laffeaty, Langton, Lenthall, Letellier, Levermore, Lombardi, Malby, Marsh Bros., W. P. Marsh, Maxwell, McLanachan, Medley, Mendelssohn, Miss Mills, Messrs. Morgan and Co., Dr. Morton, Messrs. Nisbett, Paget, Palmer, Parry, Passingham, Payne, Mrs. Payne, Messrs. William Peek, Piercy, Pointer, Pollard, Pope, Pringle, Reeves, Reid, Reiner, Reynolds, Rigge, Ritchie, Rossi, Russell and Sons, Sacre, Sawyer, Schwabe, Seelig, Shuter, Slingsby, Soutter, Miss Sparks, Messrs. Spiller, Sutcliffe, Thom, Thompson, Timms and Sons, Tuohy, Turner, Captain Verney, Messrs. Wainwright, West, Wettern, and Lieut. White, R.N.

◆

ELECTRIC LIGHT IN THE STUDIO.

The superiority of the electric light over every other form of artificial illumination is universally admitted, and if the current were laid on by suitable conducting wires, the convenience of the electric light for photographic purposes would correspond with its admitted excellence. Unfortunately, however, the generation of a sufficiently intense electric current is, under ordinary circumstances, a matter of some difficulty and expense. The dynamo machine required for producing such a current as a photographer may require is a compact, neat little machine, standing on but little over a square foot of surface. But, unfortunately, this small machine requires a very considerable driving power, and a five or six horse-power engine, whether actuated by steam or gas, is rather too heavy, expensive, and troublesome a piece of apparatus for the average photographer to invest in. True, we have frequently heard of small dynamo machines which, when driven by manual power—say, one strong man—would give a light suited for portraiture. But these have, on enquiry, always resolved themselves into machines which were soon to be introduced into commerce by Brown; which Jones was on the point of completing; or which Robinson would have ready in less than a week.

When the photographer looks around him with the object of selecting a suitable battery for initiating the required current, he is extremely likely to finish his deliberations by concluding to reject them all, and to postpone his electric light scheme for a season.

The battery of Grove is that which is most usually employed when a battery light is required; but, from a photographer's point of view, this apparatus possesses some very notable disadvantages. The slow but continual dissolving of the zinc plates during the whole time that the battery remains charged, represents a constant expense, whether sitters arrive or not; and the abundant nitrous fumes which are liberated when the apparatus is much used, serve not only to rot and discolour almost every textile fabric in the studio, but also to tarnish metal articles, and irritate the lungs of the photographer.

We shall shortly publish a description of a semi-portable electric light apparatus which Mr. Jarman has devised for the use of the photographer. The electro-generator consists of a battery of forty-eight large bichromate elements, this battery being arranged that the frame-work carrying the plates may be quickly lowered by a mechanical arrangement, so as to bring the battery into immediate action. The regulator or lamp is an ingenious contrivance devised by Mr. Jarman, and it serves to keep the carbon pencils at an approximately equal distance while the current passes. This lamp is mounted on a sliding-rod stand, and backed with a parabolic reflector, whitened inside. In order to avoid the harshness which would result from the direct rays of the voltaic arc, an oval screen of tissue paper, about three inches long, is supported immediately in front of the light, while those rays which have an upward tendency are bent downwards by a reflecting piece, much like the peak of a cap.

As regards the working of the bichromate battery, we may remind our readers that its action is very intense for a short period (that is to say, until the thin layer of liquid immediately between the plates is notably weakened), after which the electric energy developed diminishes rapidly; but it may be revived again by lifting the plates from the cells, and re-immersing them. This circumstance would altogether unfit the bichromate battery for use in cases where a steady electric light is required for a prolonged period; but it in no way interferes with the applicability of this battery to the requirement of the photographer. In our presence Mr. Jarman recently produced some excellent negatives in three seconds, the pictures being half-length on a carte-de-visite size; while an exposure of five seconds served for a full-length, the figure being much more evenly illuminated than is usually the case with pictures by artificial light. Now, as the battery will continue in action with tolerable uniformity for at least ten minutes at a stretch, all requirements as to constancy are more than fulfilled; and, indeed, one-fourth of this time would suffice for the copying of a map or plan with a lens well stopped down.

One notable advantage of Mr. Jarman's system of studio lighting is the circumstance that no expenditure of material is incurred while the apparatus stands charged, but out of use; neither are any fumes given off, whether the battery is in use or standing idle. Mr. Jarman has calculated that an exposure of three seconds costs less than one penny, the consumption of zinc, bichromate, acid, and carbons included; and we certainly think his estimate is not at all under the mark. It is needless to say that the first expense of an apparatus of this kind is a mere fraction of the cost of a dynamo machine and suitable motor.

In an early article we propose to describe some experiments we have made with Swan's lamps as a source of actinic light.

◆

FERROUS-OXALO-CITRATE DEVELOPER.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

Since I wrote two months ago regarding this developer, experiments have been made in my laboratory with it, and to my mind the results are remarkably satisfactory. I would first, however, detail some experiments made by Mr. Ray Woods for me, since they may throw some light upon what might otherwise appear as discrepancies when others tried to work the developer. It may be recollected that the mode I took to make this developer was by taking potassium citrate solution, and dissolving in it as much ferrous oxalate as it would take up. At my request Mr. Woods tested the solubility of the potassium citrate in water, and the ferrous oxalate in different strengths of the citrate solution. It was found that 800 grains of potassium citrate would dissolve in one ounce of water, increasing the volume about 30 per cent. When ferrous oxalate is added to this, very little is dissolved, but a whitish powder settles, which is completely soluble in water, giving a greenish-brown solution. The powder contains oxalic acid, citric acid, potassium, and iron, the latter, curiously enough, being in both the ferrous and ferric state. The solution of this powder acts as a feeble developer. When the 400 grains of the citrate are dissolved in one ounce of water, we have a similar result. A more reasonable quantity to dissolve is 100 grains in the ounce of water, and when cold this will hardly dissolve any ferrous oxalate, but when warmed it takes up about twenty-five grains, and forms a reddish brown solution, turning greenish-brown; when in the former state it is a more vigorous developer than in the latter. If the citrate be increased to 150 grains, there does not seem to be any resulting benefit in the development. I would, therefore, propose to form the developer as below:—

Potassium citrate	100 grains
Water	1 ounce
Ferrous oxalate	25 grains

The potassium salt to be dissolved first, and then the iron to be dissolved by gentle heating. By diminishing the citrate to 50 grains, and the iron to about 20 grains, the developer will be nearly as powerful.

I have already stated that this developer is an excellent substitute for the ferrous citrate developer proposed by Dr. Eder and Captain Pizzighelli for gelatine chloride plates. It is also excellent for collodion emulsion plates, since it can be employed without the use of any restrainer beyond that of the film itself. Now, to my mind, this is a most important property, as I have already stated in these columns. No one who has worked the latter process can be but aware of the danger there is of destroying the power of developing detail when such a restrainer as bromide is used. Now, in the case of this developer (always supposing it to remain in the ferrous state) there will be no destroying action; it will act simply where light has acted, and in no other parts. This, then, should be a standard developer, very much in the same way that hydrokinone is, the one variable being entirely eliminated. With gelatine-bromide plates, the development takes place with fair rapidity, and gives a beautiful image, as I have myself found in all the plates I have tried with it. The same sensitometer number is shown in trying this developer against the ferrous oxalate. The exact chemical composition of the developer is somewhat difficult to determine, but I hope to do so shortly, as it is an interesting point.

Meanwhile I may say that photographers who are using gelatine chloride according to Dr. Eder's direction will not do amiss to give this developer a trial. In this case it can be used without any restraining chloride. It is more easily prepared than that recommended by Dr. Eder, and is certainly more powerful in its action, and also more economical, which is a consideration. In regard to price, it compares favourably with the ferrous oxalate, and a great advantage over it is that the solution remains clear and free from crystalilzation during a lowering of temperature.

Those who still use either bath dry plates or collodion emulsion plates, will find it an invaluable aid in developing. A bath dry plate, for instance, can be developed without any of the old developing solutions, an image full of detail being brought out with a minimum exposure, the density depending on the amount of silver bromide in the film. Density, of course, can be given in the usual manner by pyrogallic acid and silver nitrate, or by acidified ferrous sulphate and silver nitrate.

◆

Reviews.

The Art and Practice of Silver Printing. By H. P. Robinson and Capt. Abney, R.E., F.R.S. (*London: Piper and Carter.*)

This long-promised volume will be heartily welcomed by photographers. Carbon printing, collotype printing, and even Woodbury printing—to cite M. Léon Vidal's recent work—all have in turn been deemed of sufficient importance to be treated of in separate volumes, but until the present moment we have lacked a book devoted specially to the process that everybody uses—silver printing.

That the present volume is well worthy the attention of photographers, whether professional or amateur, the names of the authors alone testify—we doubt, indeed, whether a happier combination of two names could have been found for the title-page of such a work: that of Mr. H. P. Robinson is guarantee enough for any one that "the art" of silver printing has been thoroughly studied, while we may be sure all that appertains to the science of the process has been adequately cared for by Captain Abney.

Combination printing and vignette printing, which may be considered the finer branches of the art, have been treated in special chapters, while those who are anxious to learn about the finishing of prints will find all the information they require under the headings, "Enamelling Prints," "Cameo Prints," "Encaustic Paste," &c.

In a word, we can heartily commend the volume to all desirous of learning or improving their knowledge on the subject of "plain and fancy" printing, and we may add that the picture of Mr. Robinson's "When the day's work is done" is a suitable frontispiece—because it is a very beautiful one—to this latest addition to the "Photographic Handy-Books," published by Messrs. Piper and Carter.

We should scarcely be doing our duty were we not to reprint the terse little preface:—

"Silver printing has been often doomed, but it still survives. Other processes of photographic printing have been introduced, nearly all of them having their individual merits, especially that of permanency, but all lacking in two essential qualities—ease of production and beauty of result. In these particulars no process has ever approached the one to the working of which this little book is devoted. The one defect of silver printing is the possibility of its results fading; but surely it is better to be beautiful, if fading, than permanent and ugly. It is better to be charmed with a beautiful thing for a few years, than be bored by an ugly one for ever. But is silver printing necessarily a fading process? We have in our possession a large number of silver photographs produced from twenty to twenty-five years ago, which are as perfect in tone and colour as when they were produced. Carefully prepared, and properly kept, a silver print should be as permanent as any other. That silver prints should be permanent as well as beautiful, has been the object of the authors."

◆

AN ELECTRICITY-LIT THEATRE.

As we announced three weeks ago, the new Savoy Theatre has been fitted on the stage and in the auditorium with the Swan electric lamp, and we gladly responded to an invitation on Saturday night to witness the first lighting up of the house. Our card stated any hour between 9.30 p.m. and midnight, so there was plenty of time after visiting the crowded and brilliant *soirée* in Pall Mall to go off to the new theatre in Beaufort Buildings.

There was no performance on Saturday, therefore the whole arrangement of the electric lighting could be seen to advantage. Messrs. Siemens Brothers, the well-known electric engineers, supply the dynamo machines—that is, the large magnet instruments out of which is ground the electricity by the rapid revolution of armatures—while Mr. Swan's share of the work consisted in the delivery of no less than twelve hundred of his little incandescent lamps. The main feature about the Swan lamp, as everybody knows, is a loop of carbon thread, in a vacuum, which becomes white hot on the passage of an electric current, and which naturally enough gives out more or less light according to the degree to which it is heated. We may at once say that Mr. Swan's part of the bargain has been fulfilled; not a single little glass bulb did we see in the rows and rows of incandescent globules that failed in its duty, and had there been but a more liberal and equal stream of electricity from the Siemens machine, the Saturday night exhibition would not have been an experiment—as it was truly called by Mr. D'Oyly Carte, the manager—but a full-blossomed success.

In any case, it was a wonderful sight to view 1,200 electric lamps all aglow. As you stood on the stage facing the gaily-furnished stalls and handsome galleries, nearly all the lamps could be seen at one and the same time. The float, or what is usually termed the foot-lights, seemed a string of golden beads, for there are something like 150 lamps here alone. Overhead were six or seven similar rows of shining points arranged from front to back of the stage, lighting the scenery and "borders" above, termed, in theatrical parlance, the battens; these battens each consisted of 100 bright and glowing lamps. Again at the side, termed wing-ladders, were more lights—here arranged in pairs—for the lighting of the wings or side-scenes. Up in the "flies," as the side galleries above the stage on either hand are termed, were yet more of the electric glow-worms.

Regulating of the lamps is in the hands of the prompter, who stands, in all English theatres, at least, on the proper left of the stage. Here, arranged upon a brass tablet, are a series of handles that permit the lights of borders, float, wing-ladders, and auditorium to be lowered or heightened at a moment's warning, according to the exigencies of the play in course of action. As we have said, on Saturday night there was not a sufficient stream of electricity coming from the engines to keep the lamps steadily aglow (there was but one engine of 120 horse power for the whole 1,200 lamps), and the manager, therefore, took occasion to exhibit the ease with which gas may be made to replace electricity in the event of a breakdown; for the theatre is throughout lighted by electricity and gas.

The auditorium is illuminated by Swan's lamps in groups of three ranged round the galleries, little pear-shaped drops that looked like opalescent pearls emitting the softest illumination. In the corridors the lamps are also to be found, and even in the dressing rooms the tiny electric globes find a place. Two very important improvements are thus effected in the theatre: risk of fire is reduced to a minimum—for no danger is to be apprehended from flaring jets among the scenery—and the atmosphere of the house is no longer vitiated and heated by burning gas.

Mr. Swan, who has been very busy in the manufacture of his lamps—a whole army of German glass-blowers have been summoned from the Black Forest to make the little bulbs—was to have been present on Saturday night at the theatre, but, up to a late hour, had not arrived. There was, however, an excellent opportunity of judging of the effects of the illumination upon costumes and toilets, for many ladies were present on the stage to witness the experiment of lighting up a theatre for the first time with electricity. The effect was more that of daylight than of gas illumination, but there was none of that garishness and livid whiteness which is usual with most electric lights. We believe, from what we have seen, that the Swan lamp will be well fitted for the wants of the photographer, and next week we shall detail some experiments we have made in producing portraits and enlargements by its means.

REPRODUCTION OF NEGATIVES FOR SINGLE TRANSFER CARBON PRINTING.

BY W. T. WILKINSON.*

Notwithstanding all the efforts to introduce double transfer carbon printing into general use as a substitute for the beautiful "but evanescent" silver print, especially for publication, photographers are almost unanimously of opinion that it neither pays, nor yields results such as will induce the public to accept carbon instead of silver. The reason of this is not far to seek. The process is too uncertain and tedious for commercial work, whether the temporary support be glass or flexible support, as when glass is used, except in very skilled hands, the chances are that less than 50 per cent. of the prints refuse to leave the old love for the new; and when flexible support is used, in addition to the difficulty of transferring, is the uncertainty whether during the development the print will stay in its place or blister up, these being without taking into account the bore of preparing the two supports. Certainly, if India-rubber paper be used for the temporary support, not only is the result better, but all these troubles are reduced to a minimum, except that the process is still tedious. Of course, we have often been told that the *raison d'etre* of the double transfer carbon process is merely to utilize the large stock of negatives already in the possession of photographers, and that the best results in carbon are only to be obtained by the single transfer process, which will give as good results as silver, and can be worked as economically and with as much certainty as silver. But then single transfer carbon requires what are called reversed negatives, and the question is, how are these to be obtained, and how are all the old negatives to be reversed. Certainly, all fresh negatives might be taken reversed by using a mirror, and the old ones stripped from the glass, but it would be manifestly awkward to have a stock of negatives some of which are reversed, and the rest not. As to stripping the films, that is far too uncertain and risky an operation to be thought of; therefore, for small orders, silver printing must be the method in use until another (for use with ordinary negatives) is introduced giving results as good in quality, in economy, and certainty, but more permanent.

For publication or large orders, especially when required in a hurry, it is the practice to multiply the negative, making as many as required to get the orders off quickly; this being the case, why not make reversed negatives, and let the prints be by that simplest of processes, the single transfer carbon?

Some years ago Mr. Burton suggested that valuable negatives should never be subjected to the wear and tear of silver printing, but that a carbon transparency should be made, from which negatives for printing from are produced in the camera; but I would suggest that from the carbon transparency negatives be printed by contact upon gelatine bromide plates, with the aid of artificial light, when, by careful manipulation, any required number of exactly uniform negatives can be produced; and as such negatives are reversed, they are available for printing in carbon by the single transfer process.

Apart from any other advantage that may accrue from the facility with which negatives may be produced by this method, there is another which cannot be too highly estimated, and that is the opportunity offered of so greatly improving upon the quality of the original negative, because it does not always follow that the original negative is always good; it may be thin and flat, and yield anything but brilliant prints, with all the dodging that skill can bring to bear upon it. On the other hand, it may be so hard and dense, that even in the brightest sun, one print per diem is all that can be counted upon. Now, by the use of a suitable carbon tissue for making the transparency, both these defects can be overcome.

In both these cases, the tissue best adapted for making a suitable transparency is a thin fine tissue, such as is issued by the Autotype Co. for small portrait work, Nos. 113 and 114. For a thin negative the transparency must be printed just dark enough to show all detail well out, then intensified with permanganate of potash, or Mr. Burton's method with ammonia nitrate of silver, followed by pyrogallic and silver. When the original negative is very hard or dense, print as deep as possible, short of allowing the action to extend to paper supporting the tissue compound, whilst for good ordinary negatives the special transparency tissue will be found to be best for use.

A suitable transparency having been obtained, judicious retouching can be resorted to for its improvement. Spots and blemishes may be removed as minimising the work upon the resulting print.

With regard to making the transparency, the simplest method of procedure is, after exposing the tissue for the requsite time under the negative, to polish a plate free from scratches, &c., and coat it with thin iodised collodion (previously filtered), and when the film has thoroughly set, place in cold filtered water; now, when the alcohol and ether have been eliminated, and the water flows evenly over the film, place the exposed tissue in the water, and at the proper time bring the two surfaces together under the water; lift out and place upon a flat surface, lay a piece of India-rubber cloth, or of single transfer paper previously wetted, over the plates, and apply the squeegee vigorously; then, after an interval of five or ten minutes, proceed to develop in warm water which is clean and free from floating particles.

Printing the negatives upon gelatine plates is best done by the light of a good paraffin lamp, such as a silber or a duplex, placing the printing frame about three feet away from the light, and when once the right exposure has been hit, as many negatives as may be required can be produced of exactly uniform quality, when they may be all printed together in one sheet, so minimising the labour.

---

* Read before the South London Photographic Society.

Notes.

The Exhibition in Pall Mall closes on the 12th of next month.

Geneva is to have a photographic society; it will be the only one in Switzerland when it is formed.

It is definitely fixed to open the Electric Exhibition at the Crystal Palace in December.

"Notes" from the Exhibition. The most striking examples of instantaneous work are the fluttering swan of Messrs. Hunter and Sands, the bird raising itself momentarily in the water by a rapid stroke of its wings; the falling trapezist of Messrs. Hills and Saunders, who is cleverly depicted in mid-air, a result of which the Hanging Committee think so highly that it is exhibited three times over, twice on the walls, and once on the table; and the cock-fighting scene of Messrs. Marsh Brothers, which is so realistic that we feel sure no magistrate would hesitate to convict upon its evidence.

Touching Messrs. Marsh Brothers' exhibits, we heard a well-known critic make a very uncomplimentary remark on their charming little pigeon photographs last Saturday afternoon. "Vile! I call them vile!" he said, under his breath. We asked him why, for not only does he represent an influential journal, but he is regarded as the highest authority on pigeons in the kingdom. Messrs. Marsh Brothers will be relieved to know, then, that he approved the pictures, and was only execrating "the breed." So that if a photographer one of these days hears a critic apostrophise a portrait as odious and disgusting, the former, before he takes affront, will do well to find out whether it is the photograph or the photographee that is at fault.

Another remark overheard on Saturday afternoon: "There is poetry in them." The critic was looking at Mr. Robinson's "Old Boat" and "Can I jump it?" and turning round we recognized in him the genial writer who is best known to the public as O. P. Q. Philander Smiff.

Photographers will do well to note these changes in the specific gravity of water containing varying proportions of nitrate of silver dissolved therein; the figures are Dr. Hornig's, but the densities can, of course, only be trusted implicitly when pure nitrate and distilled water alone are known to be present. Distilled water containing silver nitrate in the extent of—

5 per cent.	has a density of	1·041
7 ,,	,,	1·058
10 ,,	,,	1·080
12 ,,	,,	1·100
15 ,,	,,	1·125
18 ,,	,,	1·150
20 ,,	,,	1·166
25 ,,	,,	1·206

Mr. Bolas is engaged in the construction of an improved detective camera. It will be a "deceptive" as well as "detective" instrument, for the model, if he does see the camera, will have no idea he is under its eye. The new apparatus, we hear, is likely to be employed "to collect evidence" in Ireland.

The "developing-room" placed at the disposal of the South London Photographic Society by the Society of Arts should be a valuable acquisition to the former body. The South London Society has always been noted for its practical work, and here is one means the more of adding to the usefulness of papers brought before its members.

Dr. Eder's recent researches upon silver bromide are tersely summarised in *Nature.* He has shown that silver bromide prepared with an excess of silver nitrate is much more sensitive towards light than when prepared with excess of potassium bromide, provided the silver bromide is disseminated through an indifferent substance—*e.g.*, collodion pyroxyline, &c. When disseminated through an easily oxidisable substance—*e.g.*, gelatine or gum—silver bromide prepared with a slight excess of soluble bromide is from four to six times more sensitive than when disseminated through indifferent collodion with excess of silver nitrate. An emulsion of silver bromide in gelatine with a slight excess of the soluble bromide after several days' digestion at 30° to 50° becomes much more sensitive than any other known body. Herr Eder regards the photo-chemical decomposition of silver bromide as the result of partial reduction with loss of bromine.

Herr Koller, who gained a medal some years ago at Pall Mall for his charming groups of peasantry from the "Seven Mountains," has established himself in Pesth, having received the appointment of Court-photographer from the King of Hungary. We shall shortly describe Herr Koller's studio in these columns.

Our readers may have remarked that we travel a good deal to pay "At Home" visits, but the fact possibly has not struck them so vividly as ourselves, how great the distance really is on some occasions. On measuring upon a map of Europe, the other day, the interval between Largs, in Scotland, where we visited Mr. Fergus' studio, and that of Herr Koller, in Pesth, where we happened to be last month, we found that by rail and boat, it was about fifteen hundred miles.

"Every studio in Steele's Road has a camera," said an artist to us last week, in reference to this particular locality near Haverstock Hill, where painters most do congregate. It is always a trial to a painter when the time comes to part with his picture which has been on the easel for months, or may be for years, and which has been so frequently and tenderly touched that it has become part of himself. It is then that the camera's service is found useful; it permits the painter to retain a *souvenir* of his beloved work.

Topics of the Day.

CASH AT TIME OF SITTING, AND HOW I GET IT.

BY THOMAS M. LAWS.

Time was, when the photographic artist was too much wrapped up in his professional studies to spare a moment to consider the proper mode of conducting his business. Absorbed in the solution of some chemical problem, puzzling his brains over some technical difficulty that barred his progress, or indulging in flights of fancy on the possibilities of his art, is it to be wondered at that he allowed himself to drift into a current of business incapacity that well nigh overwhelmed him? Here and there a practical, shrewd mind stemmed its force, and made a separate channel, leading the way to success; but numbers neglected to follow and amongst them some of our best workers persisted in pursuing the realms of art without its emoluments.

Cash at time of sitting! Cash at any time was an event with some of the pioneers of photography, and whether blameable themselves or not, there is no doubt they had much to contend with in dealing with the business foibles of the customers, and even yet the conflict is not ended.

We have the advantage now, however, that photography is on a better basis, confidence to a great extent has been inspired in its patrons, the mountebanks of the profession have for the most part returned to their proper spheres, and, with the growth of solid, imposing establishments, the public have been correspondingly influenced, and can be more easily guided in their views, and are more disposed to trust and conform to rules.

Such being the case, the matter of pre-payment is of easy solution, and only requires a start to make any photographer master of the situation. A regular standard of excellence in the work produced is the main foundation of a cash business. Given the grade or quality of the portraits, and the price, it is merely a question of value for money; and why not cash down? Bear in mind, I am assuming, as ought to be the case nowadays, that every establishment can produce work as per sample shown in reception room, with absolute certainty and regularity. Where this is not the case, people will soon find out, and flatly refuse to pay until they see their cartes. Does it not follow, then, that one advertises his own weakness, in a measure, in not being able to maintain, when once commenced, a cash business?

There are still those, however, who claim that a running account is more satisfactory, and induces larger and more frequent orders; and perhaps in some exceptional cases it does, because a certain class exists, and always will exist, whose every transaction is credit, and whom it may be worth while humouring.

So be it: with every rule there is an exception, and "give a little, take a little," is my advice. Make it a rule to ask for prepayment, impress it upon every sitter, but use tact and discrimination; lose no customer, and offend none; listen to reasons against, and be well fortified with parries. Some meet half way with a part deposit, others (who plead ignorance of the rule) with a compromise that they send the money before the portraits are delivered. It is a very delicate matter, is this cash system, and requires at first careful management; it will take time before the sitters will all conform to it, but it will soon spread among them, and be observed as a matter of course.

The rock to guard against is too obstinate, rigid observance. Such an advice as the following by a writer, two or three years back, is injurious, and offends the taste alike of artist and sitter: "I demand my pay when the negative is made; no matter who the persons are, they must come down with the stamps. If they are honest, they are willing to; if they are not, I have lost all I want to lose, so I throw the negative into the wash." Very suitable, perhaps, for our Yankee friends, but, to borrow their own phrase, "it won't wash here." Business people by chance having opportunity, suddenly desire to be photographed. They may not have at the moment the necessary cash, and it would be palpably suicidal to force your rule in such cases.

It is not necessary, nor does it tend to sustain our profession, to intrude printed notices with an intimation for ready cash. Some actually descend to have such in the studio during time of pose, and request the sitter to fix his eyes on it. All such aids are superfluous.

The two systems of getting cash at time of sitting are: First, before the actual sitting; and second, immediately after. I can confidently recommend the latter as the best and most effectual. Granted, the sitter is well received, is informed definitely the price, the following routine is observed. One sitter after another is sent in rotation to the studio, and, after being photographed as predetermined, returns to reception room, where the attendant is ready, with receipt book in hand, to take the order. In writing down the necessary particulars, the attendant takes it as granted that the cash is to hand there and then, for she proceeds at once to fill in the receipt portion. Now it is found in practice that the hint is taken; and, without a hitch, one after another pays down. Once fairly under weigh, there is no need of explanations or enforcements; the sitter is initiated into the custom while waiting his turn in reception room; thus, by seeing what is evidently the regular practice, he is prepared, and "follows suit."

Now and again, although rarely, there is a dissentient, who, however, does not object to pay for first print or proof which, though dearer for him, is to his mind more satisfactory. In every case where proofs are given, each proof has a distinct value, and although striving to avoid the preparing of proofs, yet they are done when required, but they must be prepaid. To submit work merely on approval is demoralizing; it places one on a false footing, and undermines a photographer's independence. Re-sittings are of seldom occurrence in well-regulated establishments; mere whims and caprices should be charged for, but a genuine failure should be re-taken without hesitation.

Another little matter worthy of note, before concluding, is the payment of postage by the sitter. In many places where a large delivery of cartes takes place every week, a further charge of one or more pennies, as the case may be, is made. It is fair and equitable, and, put in practice, becomes a rule, and gives mutual satisfaction.

BY B. RHODES.

To get cash payments in photography is not so difficult as many suppose. Once make up your mind to do a cash trade, and if you are compelled to do battle, push your point to a successful issue, and it is surprising how soon your sitters fall into the working of your system. Constitute it as an undeviating rule, and you will be rewarded at every turn. Your temper is better, consequently your health; your work is better, because you feel sure of being paid for it; your bills are paid, your credit good; in fact, your business is a perfect Elysium compared to the grumpy, disagreeable, unhappy gentleman who transacts his business on the long and short credit system.

I know several photographers who lose scores of pounds yearly by being "mealy"-mouthed and afraid to ask for cash, fearing they might offend a customer. If a customer be sensible and honest, and the matter put before him with courtesy and frankness, there is little fear of giving offence. If you lose one cantankerous customer, ninety-nine others support you, which pays well. Your humble servant carried on the credit system for years to his cost, but has seen the errors of his ways and reformed, and I say unto all my brethren, "Go ye and do likewise."

How to get the cash is the next point. The *modus operandi* varies with the different temperaments and moral education of your clients. Some *will* pay, others *do* pay, another *may* pay, and the last won't if he can avoid it.

The first is a paragon of honesty, cheerfully pays his money while you take his name and address, pleasantly departs, then you bow your head, heave a silent prayer, and all is peace.

No. 2 is the hesitating customer, who is nevertheless easily disposed of. You politely ask if you shall give him a receipt now for the amount; he replies, "Certainly," pays his money, and is gone.

No. 3 is the one who has not the slightest idea of paying at the time, and is just about leaving the reception-room, when you apologise, and remind him that he has forgotten to settle for the photographs. In answer, he says he has been photographed at many places before, and never been asked for the money. You explain, in an affable manner, the rules of the establishment, and appeal to him as a *business* man the importance of adhering to your adopted method of transacting business. He rejoins: "If such is your rule, I have no desire to break it; and as I have to pay, I may as well do so at once."

No. 4 is the one who always fears he is going to be done, and flatly refuses to pay until he gets the pictures, as he may not like them, &c. This, as a rule, is a difficult subject. You might try a joke with this one, with impunity; and, if you can succeed in exciting his risible faculties, you have gained a point. I generally put one or two questions to him, as follows:—"Would you seek admittance to a theatre, and promise to pay if you liked the performance?" Answer, "Certainly not!" Would you go to a railway booking-office, and tell the clerk you are going a journey on their line. If the company deliver you safely, and you enjoy the ride, you will pay them?" Answer, "Oh, that's another thing!" Not convinced yet. I at once take him into the mounting-room, open a drawer (I call it the drawer of conviction), show him 400 or 500 photographs of all kinds, which have been ordered and never called for (previous to my adopting the cash system). He sees the force of the argument, calls it a great shame, pays his money, and smilingly bids me good day.

Instances might be multiplied to an indefinite extent; but vary your procedure according to the foibles, disposition, and humour of your clients.

One thing: always avoid losing your temper, at all cost. Make up your mind to have *cash*, and every night you will be able to say: by *tact*, *good humour*, and *determination*—this is how I get it!

The "Topic" next week will be "Cheap and Effective Finished Enlargements," by George Croughton.

SOME EXPERIENCES OF DRY PLATES.

BY WILLIAM HARDING WARNER.[*]

After comparing the qualities of wet and dry plates, and dwelling upon the importance of regarding development as a science, the author says:—

I daily incline to the belief that the more nearly we can make our negatives approach to a stained film rather than a dense one—yet with a due regard to contrast—the more likely are we to obtain perfection. Both may be printed in platina or silver, using suitable paper, and masking such portions as need less or more exposure, for there is a "science" in printing as well as in development. All gelatine plates are inclined to give detail, and doing so they lack contrast. Some, however, combine these two points in a greater degree than others. Some give the one, and totally fail in the other Here, again, the wet process steps in and displays its power over the dry. Here it is where cheap plates fail, and fair priced ones succeed. The following is a case in point:—A friend of mine of some reputation in his native town (Bridgonorth, Salop) was called upon to take a group of challenge vases, silver cups, and medals won by the boating club of the locality, nearly all of which had polished surfaces (these are always difficult to obtain correctly). The cheap but rapid dry plate was the only one available just then. It gave a splotchy picture without detail. A wet plate exposed on the same day of the same subject, being slower, gave a powerful negative full of modelling and modulation of tone, with detail and contrast of shadow and high light, with every reflection perfectly defined. Here, then, is a valuable lesson conveyed. A slow dry plate would in all probability have met the occasion, and insured equal results with the wet. Again, a source of failure may often be found in the quality of the glass supplied—it should be good and flat, with a smooth even surface. As I have always used patent plate for wet plates, I dislike descending to sheet; the first cost is perhaps a little more, but it is the cheapest in the long run in every way. It has an even thickness throughout, with a perfectly smooth surface. Thus an equal thickness of film can be secured, a point most valuable when treating with varied planes of distance. If some of our great makers would adopt this suggestion, or allow those who prefer to use such, to send them their plates to be coated and made fit for exposure, they would be no losers by the operation, and we might then hear of less failures from a hitherto unsuspected source.

Just a word now upon development in the field, ere I proceed to give you the results of some experiments which have proved of the greatest value to me in supplying data to go upon. Many, I think, may be found to agree with me when I say the less pyrogallic we can use the better. This has been previously advocated by my friend Col. H. Stuart Wortley, at page 135 of The Photographic News Almanic for 1879. It serves to make plain and forcible the detail brought out in combination with a judicious use of ammonia restrained by either bromide or gelatine, the proper intensity being given by after development, either by the excellent formula of Messrs. Wratten and Wainwright, of iron, aceto-gelatine, and nitrate of silver, or by silver and ammonia B. P., restrained by gelatine, the plate requiring only a very small quantity of either, with a thorough washing afterwards, and spontaneous drying. Simplicity should be our aim, and as we have succeeded so well with the wet, we must now essay to be so with the dry process. But we must not cast off our "old love" (that hackneyed phrase, as some great gun hath it), and be on with the new, until we have mastered some of its many vagaries, whims, and oddities. When that is done, we must again apply ourselves to the discovery of the best printing process that shall place our efforts in a more pleasing and permanent form than they are at present. The following experiments will be found of interest:—

Experiments in Dry Plates.

Swan's plates used. Marked six times more sensitive than wet, and twelve months old from date of reception.

1. Exposure of 40 seconds at 3.20 p.m. on 7th January, 1881, of an interior of a room, with a lady standing in front of a sideboard with a looking-glass at back.

Lens—full aperture of Dallmeyer's rapid rectilinear, 8¼ focal length.

2. Exposure of half-an-hour at 3.40 p.m. same day of interior of drawing-room, with the blind half-way up the window, the same facing the camera.

Lens—Dallmeyer's 7 inch wide-angle landscape, No. 2 stop. The same evening these plates were developed by ruby light.—Edwards' developer. Washed, alum bath ten minutes, washed, fixed in hyposulphate, then allowed to remain in one minute after fixing, washed well, then alumed, and washed again all night.

Results.—No. 1. Just the faintest possible image. Impossible to print. Put aside as a failure.

No. 2. Better, but very faint. Impossible to print. Put away as a failure. There was not the slightest halation with the window.

Thursday, 26th May.—In orange light derived from four folds of orange paper put together with paper varnish.

By day.—Placed No. 2 in tray and gave it following bath:

Liq. amm. fort. ·880, ...	2 drops
Soft water	4 ounces

Allowed it to remain five minutes, using a soft brush at the same time to work it into the plate, which had been lying about exposed to the air. During this time I put ten drops of a ninety-six grain solution of pyrogallic in alcohol (equal to two grains) into measure, added two ounces of water with a quarter grain of bromide per ounce, and poured two ounces of the ammonia bath away, adding the balance to the pyrogallic in the measure, which was then thrown on to the plate and covered up—it at once began to redevelop; on its stopping, a drop of ammonia, with five drops of the Wortley restrainer, and one drop of a ten-grain solution of silver and citric acid, were added, which gave it fresh power and force, and after one hour's work a good clean printing negative, with all the china, pictures, and carpet in detail, was produced, thus showing the wonderfully latent property of the gelatine film.

---

[*] Read before the Edinburgh Photographic Society.

No. 1 was then tried. It took twenty drops of strong ammonia with four grains of weak pyrogallic and water to bring out full detail even to the pattern of the paper on wall of room, and detail of things on sideboard with lady's face reflected in the glass of same: result, after two hours' work, a fair printing negative. No frilling in either.

About the middle of July experiments were made with a view to developing dry plates in the field to see the results before quitting the spot. It consists, after primary development, of just rinsing the plate, then placing it in a bath of methylated alcohol for three or four minutes, remove, drain, and place in draining box to take home to finish at leisure. In a few hours the negatives will be found quite dry, and may be exposed to weak daylight. In conclusion, I need only add that oft-repeated saying, "It is not quantity, but quality," that we want; it is just this quality which has been, is, and ever will be that which makes the wet plate so charming. Let us strive in the future to equal in the dry what is so readily attainable and so worthy of emulation. As a caution to dry plate workers, I would suggest that negatives when developed and finished be put into a rack to dry, rather than placed to lean against another, as the moisture that condenses from the wet surface carries with it some portion of the gelatine and the colour deposit, to the detriment of the negative.

Correspondence.

POSTAL PACKETS.

Sir,—I wish you would use your powerful aid, and protest against the way sensitive paper is sent by post. I repeatedly get my roll open at the ends, so that it admits light, and sometimes it is crushed. If it is sealed with sealing wax, which is generally broken, either accidentally, or by the post authorities. In any case, it is the poor photographer who suffers. If sealed packets are not allowed through the book-post, then dealers should not send them, for I hold it is their business to find out how packages can be safely sent. As it is, I can get no satisfaction from my post office, or my supplier; and I think it is very hard to be between two stools. Hoping you will take the matter up,—I remain yours, &c., A Country Photographer.

SPOTS AND MARKINGS ON COMMERCIAL GELATINE PLATES.

Sir,—I see in your issue of September 23rd, at a meeting of the Manchester Photographic Society, that "Mr. Brothers exhibited a print from a negative in which markings like wire net-work had put in an appearance."

As the Exhibition of the Photographic Society is now taking place in Pall Mall, I would suggest that a space of wall should be given especially for the exhibition of prints from negatives of this description. and also opportunity given by the Society for the exhibition of negatives which give similar phenomena.

A few years ago (I think in the Photographic News Almanac of 1874 or '75), I wrote a paper referring to the vagaries sometimes exhibited by "commercial dry plates," in some of which "moon-like" spots, and very beautiful "comets," with the most perfect tails, had made their appearance. There were also "stars" with every variety of corruscation, and it certainly appears to me that the photographic world should not keep all these marvels of science to itself, but should give of its treasures of knowledge freely to the public outside.

My impression is, however, that the manufacturers of some of these plates have some private understanding with the celestial world for the production of these beautiful phenomena, and that their appearance is a trade secret known to the makers of commercial plates almost alone.

The production of the well-known "spirit photographs" was a valuable commercial secret, and produced large sums in the hands of those who knew how to fix them on the photographic plate.

In your article on "Posing for Photographs," in a recent number of the Photographic News, I see in the last paragraph reference to a large Daguerreotype as a possible explanation of some of these markings and phenomena. I would add, however, regarding my paper in the Photographic News Almanac, referring to those photographic wonders, that the maker of some of the commercial plates referred to, wrote me a private letter acknowledging the justice of my description of his beautiful "comets" and "stars," but stating also his regret that I had called attention to the phenomena in your columns, as the ordinary practical photographer (whether amateur or professional) could never be made to understand the joke of having a fine comet with a flowing tail right across the trees of a landscape, or a star with radiating corruscations in the eye of a portrait, or a number of round spots of various sizes (but beautifully round, all of them) distributed with impartial eccentricity all over the developed and fixed negative. I believe that Mr. Brothers, of Manchester, is not a photographer of yesterday, and that he may have his own ideas as to the origin of some of these "wire-work markings," "spots," "comets," and "stars."—Faithlully yours,

Francis W. Turton, Commander, R. N.

Bagni di Lucca, Italy.

CHEAP DEVELOPMENT.

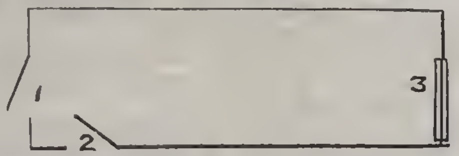
Sir,—I clip the subjoined from the *Melbourne Argus*; Australia would seem a good place for dry plate furnishers.

"To Photographers.—Bardwell's Concentrated Developer for dry plates, guaranteed never to fail; in 16 oz. bottles, with ull instructions, price £1. Containing sufficient to develop 256 cabinet plates or 512 quarter plates, and warranted to keep any length of time. Country photographers supplied, and forwarded immediately. The dry plate process thoroughly taught personally. For terms, apply to Bardwell, Royal Studio, 21, Collin Street, East."

Yours, &c., W. C. Crofts.

ACTINIC LIGHT DURING DEVELOPMENT.

Sir,—A great deal has been written and said about the absolute necessity of an almost Egyptian darkness while developing gelatine plates. Now, without wishing to gainsay or deny this most probable thing, I should like to know what its ardent advocates would say to the following fact. The dark room in which I am accustomed to work has two doors at right angles. I here give a small plan of the room. Nos. 1 and 2 are the doors, and No. 3 the window. No. 2 opens directly into the studio, No. 1 into a passage leading from the latter, consequently rather a light passage. Now on two or three occasions, by a carelessness which I do not attempt to excuse, door No. 1 has been unknowingly left open four or five inches during the development of Wratten and Wainwright's instantaneous plates, and, singular to relate, the negative has been excellent—not fogged in the least.



Now of course the door ought to have been closed, but the fact that it was open, thereby admitting, without doubt, some light, seems to me rather suggestive, and to fly somewhat in the face of the "Erebus" creed, and I thought it worth bringing before the photographic community. E. G. Russell.

Proceedings of Societies.

South London Photographic Society.

The first meeting of the winter session was held on Thursday, Oct. 6th, in the room of the Society of Arts, Adelphi, Rev. F. F. Statham, president, in the chair.

The minutes of the preceding meeting, together with those of the out-door meetings, having been read and confirmed,

The President, in the course of a few remarks, alluded to this being the twenty-second year of its existence. He also alluded to the immense advance made in photography from the time of its first discovery in so short a period compared with other arts and sciences, steam having taken more than one hundred years to bring it to its present state of perfection. Referring to the application of photography, there was scarcely an art or science into which photography had not pushed its way and become of immense use one way or another. He concluded his remarks by wishing prosperity to the South London Photographic Society, now starting upon their winter session, and stating that the prosperity hitherto attained had been owing to the unity amongst its members, and that no quarrel had resulted from difference of opinion.

A letter was then read from Mr. Edwin Cocking, Assistant Secretary of the Photographic Society of Great Britain, enclosing tickets for the Exhibition for distribution amongst the members. A vote of thanks was passed to the President of the Parent Society.

A letter was also read from Mr. Henderson calling the attention of members to the fact that his Thursday Evening Meetings at Ashley's Hotel were held in no antagonistic spirit to this or any other society, and that he should be very pleased to see any of the members present any Thursday, also photographers generally visiting the Exhibition.

The Chairman announced the subject for the Monthly Competition as "On the Look-Out."

Mr. W. T. Wilkinson then read a paper "On the Reproduction of Small Negatives for Single Transfer Carbon Printing" (see page 485).

Mr. Jabez Hughes said he had failed to find anything new in Mr. Wilkinson's paper. The question of reproducing negatives was of great importance; he himself had many valuable negatives that he often dreaded to see go into the printing-frame; yet it was very seldom he could reproduce them to print equal to the original.

Mr. Foxlee said that if the tissue was not in very good working order, the collodion substratum was the best.

Mr. Wilkinson alluded to the difficulty of preparing bichromated gelatine by those making only one or two transparencies a week. He preferred a very thin collodion, say four grains of cotton to the ounce of solvent, a little iodide of cadmium being added to each ounce. The method used by the Autotype Company was the gelatine substratum, and the tissue collodionized.

Mr. Cowan asked why iodized collodion?

Mr. Wilkinson replied that the plain collodion shrivelled up, while the other made more of a film.

Mr. Hughes asked of what use was the iodide, as it was washed out at once. He used from 2½ to 3 grains of cotton, and a large excess of alcohol.

Mr. W. Brooks stated his plan for reproduction as follows:—Place the original negative in contact with collodio-bromide emulsion plate, develop with alkaline pyrogallic; this develops a positive; then well wash, and soak in a ten-grain alcoholic solution of iodine until the image is converted into iodide of silver; then well wash, and re-apply the alkaline pyrogallic; a negative reversed, similar to the original, is obtained.

A vote of thanks having been passed to Mr. Wilkinson,

Mr. Archer Clarke made a few remarks on the development of gelatine plates, in the course of which he said he preferred to mix the whole amount of pyrogallic; but care was required in adding the preservative to the water, and then the pyrogallic, else a sediment was formed. Citric acid seemed the favourite preservative, although he preferred nitric, his formula being—

Pyrogallic	1 ounce
Nitric acid	12 to 13 drops
Water	107 ounces

Mr. Clarke passed round some bottles of pyrogallic solution preserved for twelve months, the preservatives being citric, nitric, and salicylic acids, the latter certainly appearing the clearest.

Mr. Burton said a considerable amount of bromide did not lessen the density or detail, if development could be prolonged. He had come to the conclusion that the best method was to have each solution—bromide, ammonia, and pyrogallic—separate. After a little experience, a number of negatives could be developed in the same solution, one after the other, by adding a little of the different solution required.

Mr. Cowan said for plates that gave green fog ferrous oxalate was best.

Mr. Hughes said the thanks of photographers were due to Mr. Burton for his series of articles in the photographic papers, as photographers had almost got into a fixed groove with regard to the development of plates, and such daring propositions as he had made must do good.

Mr. Mawdsley called attention to the difference in preparation of plates now, the present make of plates requiring more bromide than formerly.

Mr. Truman Wood, the Secretary of the Society of Arts, wished to call the attention of members to some lectures to take place in January by Capt. Abney, stating he should be happy to supply tickets to any who wished to attend; also that an exhibition of old processes and apparatus would be held, and asking any member for the loan of anything calculated to enhance the exhibition. Mr. Wood also stated that he had had fitted up a small dark-room, which at any time was at the service of the Society.

A vote of thanks having been passed to Mr. Wood,

The Chairman said the next meeting of the Society would be the Annual Technical Meeting, held on Nov. 3. The annual dinner would be held on Dec. 3, further particulars of which would be duly announced.

Mr. Pearsall then called the attention of members and others to the resolution of the Photographic Club, passed Oct. 5, and published in the photographic papers.

The meeting then adjourned.

Glasgow Photographic Association.

The annual general meeting of this Association was held in the Religious Institution Room on the evening of the 6th inst.; the chair was taken at a quarter past eight o'clock by Mr. John Parker, President. There was a fair gathering of members.

The minutes of the last general meeting and the subsequent council meetings where read and approved of, when the following gentlemen were elected members, viz., James C. Annan, Wm. D. Clark, Henry Redwood, Walter Scott, and C. S. Thomson. J. O. Barne was elected a subscriber.

The following letter from the Philosophical Society, in reply to one asking for information as to the terms on which the Association would be admitted as a section of their Society, was read as follows:—

"John T. McLellan, Esq., *30th September*, 1881.
"Secretary of the Photographic Association, Glasgow.

"Dear Sir,—I laid the application of your Association for admission as a section of the Philosophical Society before a meeting of the Council held on Wednesday evening last, the 28th inst., and I am desired to inform you that the Council does not see its way to granting your request at the present time, and that its decision is as follows: 'After full consideration, it was unanimously resolved to offer to the Association the use of a room for its meetings for one year, on terms similar to those arranged with the Geological and Archæological Societies, reserving the question of admission as a section of the Society till a future time. The Secretary was instructed to communicate this decision to the Photographic Association, and to refer it for arrangement as to details to Mr. W. J. Miller, 100, Wellington Street, the convenor of the House Committee.' (Signed) John G. McKendrick."

The Chairman invited the members to pass their opinion upon the matter as it now stood, when Mr. Gilfillan suggested that no further steps should be taken in the matter. He thought it would not be consistent with the dignity of an independent association to act the part of a "hanger-on-to-the-tails" of any Society. Mr. Urie also expressed himself in favour of allowing the matter to drop. He thought, although affiliation with the Philosophical Society might offer many advantages, individuality as an independent Association would be lost. He also remarked that there was considerable diffidence at present amongst the members in bringing forward papers and other matters for discussion. If this was the case under existing circumstances, he thought it would be considerably increased under the proposed change, when efforts in that direction might be subjected to the criticism of some of the most scientific men of the day. The matter was ultimately left in abeyance. The Secretary was instructed to call in the meantime upon Mr. Miller, and acquire any further information, and report same at next general meeting.

The President then opened the business of the session by delivering his inaugural address, which was listened to with great attention, and seemed to give much satisfaction. The lecturer spoke in flattering terms of the progress which had been made in photography, and anticipated for it a sphere of usefulness among the scientific discoveries of the century to which it would be vain to set a limit. He also spoke of the objection which artists, in the proper sense of the term, oppose to photography as an art, all of which he clearly showed to be fallacious and untenable. He spoke also in eloquent terms of the elevating influence of the pursuit of photography, and severely criticised the unsatisfactory and inartistic nature of photographic groups. In speaking of sky shades, he observed that a good one that can be readily adjusted to the outline of the sky is still a want, and he thought that if some of the ingenuity that had been so fully devoted to produce such a shade, so that the sky and foreground might each receive its proper proportion of exposure, it would be an immense benefit to the landscape photographer.

Some of the negatives taken at the out-door meeting on the 26th ult., and prints taken therefrom, with a splendid collection exhibited by the President in illustration of his subject, were placed on the table, all of which were favourably criticised, and elicited the hope that the "field-day" would become a permanent institution.

It was intimated that a question-box would be placed at the door on future meetings.

Mr. Gilfillan moved that a scrap-book should be obtained in which to keep any prints that might be presented to the Association. Mr. Dodd seconded the motion.

The Secretary remarked that there were already sufficient to fill a large album; and he, with the Treasurer, were instructed to have this idea carried out forthwith.

Mr. Bell asked how it was that prints mounted on tinted boards would not adhere, but invariably peeled off when dry. He had noticed this drawback in the work of other photographers, and it was a very troublesome fact in his own studio.

Mr. Urie explained that the tinted boards are printed with a greasy lithographic ink, and consequently repelled the paste. He suggested the addition of ox-gall to the mounting medium.

Mr. Dodd said he had never experienced this drawback in the use of tinted boards, of which he uses large quantities, and mounts with corn starch paste; and the

President gave it as his opinion that gelatine dissolved in methylated spirit was the best mounting medium.

The Secretary placed upon the table nine copies of the *Photographic Times*, being the volume since the beginning of the year, which he had that day received from the publisher in New York, addressed to the Association; also two prints received from Mr. Rogers, Broughty Ferry, being groups of the members and friends of the Dundee Photographic Society, taken at Kennaird Tower on the occasion of their second annual picnic. He (the Secretary) was instructed to acknowledge receipt and express the thanks of the Association.

There being no further business, the meeting closed with a vote of thanks to the President for his able address.

Edinburgh Photographic Society.

The last ordinary meeting for the session was held at 5, St. Andrew Square, on Wednesday, the 5th inst., Mr. John Lessels, President, in the chair.

The minutes having been read and approved, the following gentlemen were elected ordinary members:—Messrs Robert H. Eagle, William Adamson, and William Lyon.

The Secretary submitted specimens of the presentation prints for this year—two large photographs printed by the Lichdruck process, entitled "The Pause in the Dance," and "The Visit to the Nurse," after pictures in the Dresden Gallery by Vautier and Ritscher respectively. The pictures were much admired, and seemed to give general satisfaction.

The Chairman then called upon Mr. F. P. Moffat to read a paper received from Mr. W. Harding Warner, of Bristol, entitled "Some Experiences with Dry Plates" (see page 488). Several prints were shown illustrative of the paper.

Mr. Thomas Pringle said he did not quite agree with Mr. Warner in his remarks about cheap plates. He had tried all kinds, and found the cheap work quite as well as the dear. In developing all kinds of plates, he used Edwards' formula, which he found extremely handy. One thing he would like to draw attention to was the very inferior quality of glass supplied by manufacturers of gelatine plates.

The President said he quite agreed with Mr. Pringle in regard to the glass, and it was not merely the makers of cheap plates that supplied it, but, on the contrary, he generally found the dearer the plates the worse the glass. He further remarked that Mr. Warner may have found a wet plate more suitable for the interior of the church he took; but if he came to photographing churches on the Continent, with stained glass windows, coloured scrolls, and dark pulpits and altars, he would find dry plates much better; for what formerly took one and a quarter hour's exposure could now be done in four minutes.

Mr. F. P. Moffat said if plates of various degrees of rapidity were used, as recommended in the paper, one would be very apt to get into a mess.

Mr. J. M. Turnbull said Mr. Warner's paper contained such a variety of information, that it was difficult to discuss any part of it definitely. Some of the statements in the paper were so startling, that he was afraid it was impossible to quite agree with them. The purport of the paper seemed to be that the wet was better than the dry. He thought Mr. Warner was in that transition state which all dry-plate photographers had gone through, not having yet given up the wet, and just feeling their way with the dry; in fact, one might call them damp. Regarding the prints which were submitted along with the paper, the hardness and splotchiness of which Mr. Warner complained, and attributed to halation, he thought merely due to under-exposure. Gelatine plates were well known to give rather too much detail if fully exposed. In regard to what Mr. Pringle said about the quality of the glass supplied by dealers in gelatine plates, he quite agreed, and his experience also was that the dearer plates were on the worst glass.

Mr. Rankine thought there must be some mistake in regard to the time of exposure of one of the groups—the one with a dog in the foreground. It was marked four seconds, but although the dog had its mouth open, and was evidently panting, it was most minutely sharp.

Mr. Alexander Mathieson asked if any one could inform him if transparencies for the lantern could be made on gelatine plates developed with ferrous oxalate with absolutely clear shadows?

The President said he believed such a thing could be got, but up to the present he had failed in any that he had tried.

Mr. William Neilson proposed a vote of thanks to Mr. Warner for contributing the paper for the evening, and the meeting adjourned.

Dundee and East of Scotland Photographic Association.

The first general meeting of the above Society for the session of 1881-2 was held in Lamb's Hotel, Reform Street, on Thursday, Oct. 6th, Mr. J. Robertson, Vice-president, in the chair.

The Hon Secretary (Mr. C. Johnson) read the minutes of last meeting, which were confirmed.

The following gentlemen were next elected members of the Association, viz.:—Messrs. Peter Ker, W. Ritchie, C. C. Calder, J. F. Calder, John Mollison, George Merson, and Mackintosh. Congratulatory remarks were made as to the accession of new members.

Mr. J. Robertson, Vice-president, was unanimously elected Hon. Treasurer of the Association.

Mr. C. Johnson (Hon Sec.) was glad to announce that several members had promised to read interesting papers during the session, and that popular evenings, open to members and friends, enlivened by lantern entertainments and lectures, would be held. It was also expected that as the Association's Exhibition opens in February next at the Albert Institute, some of the brightest lights in photography would rise in the Dundee horizon, and shed their beams on this important occasion.

Thanks were voted to J. T. Taylor, Esq., for his contribution of the *American Photographer*.

Thanks to the Chairman closed the meeting.

Thursday Evenings for Photographers.

At the meeting held on the 5th inst., Mr. H. Morington in the chair,

Mr. Henderson gave a description of his recent trip to the Paris Electrical Exhibition, and exhibited an electric gas lighting apparatus he had purchased there; which consisted of small circular metal box, in the bottom of which was a carbon plate. A quantity of asbestos saturated with a solution of bichromate of potash was placed in the box, and the lid put on; a small zinc plate attached to the under side of this lid was then, by means of a button on the top, pressed down on to the asbestos, and the electric current generated by the contact was communicated by means of the spring working the button to a conducting wire enclosed in a tube, at the end of which was a piece of platinum which became incandescent. Upon the apparatus being tested by placing it in a stream of gas, it pressing the button the gas was immediately ignited. He also showed one of Professor Stebbing's pellicle negatives, and briefly described the process of development, which is as follows:—The film having been exposed behind a piece of glass in the dark slide, it is slightly greased round the edges to prevent any moisture getting between the film and its support, and then placed in a developing tray and the developing solution poured in; when sufficiently developed the solution is poured off, and, without removing it from the tray, the negative is slightly rinsed; it is then fixed with hyposulphate and again rinsed. A piece of glass slightly larger than the negative, and which has been dusted over with powdered talc, is then placed under it, and it is removed from the tray. Narrow strips of gummed paper are placed round the edges of the negative to prevent it curling up when drying; when dry, it is removed from the glass, and can be printed from either side.

Mr. Cobb showed a series of prints from negatives two inches square, taken with Harrison's Bijou camera by Mr. Henderson, from the windows of railway carriages and the deck of a steamer during his trip to Paris.

A very fine specimen of photography by M. Barrenne, of Paris, was exhibited.

Newcastle-on-Tyne and Northern Counties Photographic Association.

A largely-attended meeting of members was held on Tuesday last, in the Lecture Room of the College of Science, under the presidency of W. Armstrong, Esq.

The minutes of previous meeting having been read, several new members were balloted for.

The Chairman, in his opening remarks, said that the Secretary had not received that response to the circular issued a short time since that could have been desired.

Mr. J. I'Anson exhibited a series of large prints, some of them very fine enlargements on the gelatino-bromide paper, which were greatly admired.

Mr. Mendelssohn presented to the Society a large photograph, which was characterised by the Chairman as a most remarkable picture, deserving especial attention.

Messrs. Gibson, Sawyer, Smith, Ridley, and others also contributed prints of their summer's work.

The Secretary then exhibited, by means of the lime light, a large number of photographic transparencies, many of which were the work of members, while some very excellent ones were lent by Messrs. Coote, Woodward, and Lee.

On the proposition of the Chairman, a hearty vote of thanks was given to the gentlemen who had contributed to the interest of the meeting.

With respect to forthcoming meetings, it was announced that Prof. Marrecco had promised a paper for that in November, and that the Committee proposed to make the December meeting an open one, at which every member would be expected to contribute at least three photographs.

Talk in the Studio.

Soiree at the Photographic Society.—The usual Soirée at the opening of the annual Exhibition was held in the Society's rooms on Saturday last at 8 p.m., when a brilliant and very crowded gathering honoured the Society with its presence; they were received by the President, Mr. James Glaisher, F.R.S., F.R.A.S., the Treasurer, John Spiller, Esq., F.C.S., and other officers of the Society, and remained till a late hour inspecting the pictures.

A jury of experts of authority, having examined Herr Van Beer's picture "La Siréne," in preparing which the artist had been, as we have reported, accused of nefariously employing photography, has entirely exonerated the painter, and explained his mode of working.—*Echo.*

Solid Matter in Solutions.—An ingenious method for determining the total solid matter in solution in different waters is described in *Chem. Soc. Journal* by Dr. Mills. The method is based on the fact that if a small glass bead with an attached weight is allowed to ascend in a saline solution of known strength, it will rise more slowly the greater the amount of solvent present. Experiments are given showing that the rate of ascent is also dependent on the nature of the soluble matter *i. e.*, on the viscosity of the solution. For detecting variations in the solids in the same water, for preparing standard solutions, &c., the bulb method is likely to be useful. Experiments detailed in the same paper lead Mills to regard the specific gravity of a potable water as a direct indication of the quantity of total solids in solution.

Studies on the Chemical Action of Light, by M. Lemoine.—He has compared experimentally, from various points of view, the influence of light with that of heat in chemical reactions; considering, more especially, isomeric transformations, and the influence of dissolution, temperature, organic matters, and colour. *Inter alia*, chloride of silver, so sensitive to light, is unaltered by it when disolved in ammonia. The rate of chemical transformations often varies extremely with the temperature, for light as well as for heat. Presence of organic matters often accelerates a reaction in light, and allows of its commencing at a lower temperature. For various substances which heat alone would decompose at low temperatures, the red end of the spectrum seems much less efficacious than the violet end; but in time both lights seem to produce the same effect. *Nature.*

To Correspondents.

⁂ Pressure on our columns necessitates the postponement of "At Home," and other important papers.

⁂ A cheque for two guineas will be paid for the best practical article on "Photographic Residues and Waste; What is worth saving, and how I save it." The name of the author need not appear. For rules, see previous numbers of News. Contributions must reach this Office by the 1st November.

Cardiff.—The crude sulphide of potassium, known commercially as liver of sulphur, is the compound usually employed.

P. G. W.—1. One and sixpence each picture. 2. See the new book on Printing, by Captain Abney and H. P. Robinson.

D. J. C (Cork).—1. See answer to P. G. W. 2. Our Publishers undertake to procure the registration.

Samuel Redlow.—1. The addition of ammonia may, under the circumstances, give rise to the production of a very dangerously explosive substance. 2. Nitric acid has no action whatever on them.

G. P.—The front combination of the lens will, if good, answer admirably for the purpose. The stop should be about an inch and a half from the flat or concave side. If you turn the convex side towards the view—that is, use it as placed at present—the distortion will be pincushion-like; but if reversed, the distortion will be of the barrel kind.

Aspirant.—1. Those who are most successful take care to avoid the use of water at a higher temperature than is absolutely necessary. 2. Coat the tissue with collodion, and allow this to become nearly dry before mounting it. 3. It is of doubtful advantage, and scarcely ever done in actual practice.

Employer.—You have no remedy as far as the breach of confidence is concerned, but if he has taken away samples of your materials, you could doubtless institute a criminal prosecution.

J. T. Jones.—1. Not unless a considerable proportion of chrome-alum is added. 2. A five-grain solution of silver nitrate to which an excess of a saturated solution of potassium cyanide has been added (that is, enough to re-dissolve the precipitate first formed) will answer your purpose, if mixed to a cream with whiting, and rubbed on the copper.

M. Holmes.—The fact of the nitrate of silver having been kept for some weeks in paper would probably account for your difficulties. When using such contaminated silver you will probably have to make the bath decidedly acid.

More Light.—1. To satisfactorily actuate the machine you allude to, a five or six horse-power engine would be required. 2. Usually electro-coated with copper or nickel. 3. Not likely to prove satisfactory.

Dark-Room Assistant.—1. Your collodion is evidently over-iodized; add one-fourth of its bulk of plain collodion. 2. A little risky, but generally successful when skilfully managed.

Fred. Chiswell.—1. About three grains to the ounce. 2. Two names for the same thing. 3. Let us have further particulars, and we will do all we can to help you.

C. M.—If what you send is an example of your best after two years' study and practice, you had better give up photography.

S. Barton.—The stains evidently arise from the use of dirty glasses. A prolonged soaking in the following will generally prove equal to removing any kind of impurity.

Bichromate of potassium	2 ounces
Sulphuric acid	4 ,,
Water	10 ,,

James Smith.—1. You must not expect results equal to those obtained on paper which you sensitize yourself. 2. Detailed information will doubtless be published on the subject before long.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1207.—*October* 21, 1881.

CONTENTS.

	PAGE
The Photographic Exhibition	493
Seasonable Hints to Emulsion Workers	494
An Exhibition of Photographic Appliances	495
Photography In and Out of the Studio	496
At Home.—Herr Th. Prumm, Unter den Linden, Berlin	496
Notes	498
Topics of the Day.—Collodio-Chloride Emulsion for Development. By Captain W. de W. Abney, R.E., F.R.S.	499
A Complete Electric Light Apparatus for Photographic Purposes. By A. J. Jarman	500
French Correspondence. By Leon Vidal	500
A Short Tour in North Wales. By Dr. Morton	502
Correspondence	503
Proceedings of Societies	503
Talk in the Studio	504
To Correspondents	504

THE PHOTOGRAPHIC EXHIBITION.

(A SECOND VISIT).

The pictures spoken of first in the catalogue are simply too high to be examined. Mr. J. Catford, whose name stands at the head, has, however, other prints further on, of which the best, probably, is Ilfracomb Swimming Bath (225). The Screes, Wastwater (2), by Messrs. T. A. and G. Green, represents good work, as does also the foliage picture (54); but they are both too lofty for proper examination. The interiors shown by Mr. Edward Fox (21) are good photographs and unpleasant pictures, for the cold, bare wards of an hospital are not likely to yield pleasing results. Other views of Alexandra Hospital (149, 151) are more grateful to the eye; St. John's Tower (23), by Mr. Sylvester Parry, needs the use of a fire-escape to look at it in its present position; other prints on the walls by Mr. Parry (226 and 239) are, however, examples of thoroughly good work.

Dumbarton Castle (24), by Messrs. T. and R. Annan, is one of the best pictures in the room. The landing pier, of dark, massive granite that juts out into the still, clear waters of the Clyde, serves as foreground to the heights beyond, while, above the old grey pile, is a magnificent sky that harmonises well with the castle. "Stepping Stones" (25), beside it, is also well worthy of attention. Some of Mr. Henry Reeves' canoe sketches (27) are striking; in one of them the dipping sails look like a flight of gulls that have just touched the water. Mr. Reeves also exhibits some animal studies (563). "Bridlington Sands" (28), by Mr. R. R. Brown, a soft and clear little picture, denotes the possession of much taste and skill.

The Hon. Mrs. Holden Hambrough, who is already known for her bold pictures of our English ruins, contributes this year more work of the same class (30, 31, &c.), but they are most of them hung too high to permit a fair view. Mr. G. Renwick depicts cold, grey winter (32-33), and summer (559), of which we prefer the former, the trees covered with a silver filigree of frost. Of Messrs. Hills and Saunders' falling trapezist we have spoken already (35); it is certainly a marvellous example of rapid photography, for although the problem may not have presented any extraordinary difficulty, still it is solved with extraordinary perfection. From the same firm, dating from Porchester-terrace, comes another work which is quite as attractive, though of a widely different character. "The Flower Girl" (279) is indeed a delightful picture, the girl's sweet expression and graceful pose at once investing it with a charm rarely met with in photographic studies. It is a gelatine print, we are told, and although the tone is one that may not find universal favour, there cannot be two opinions as to the art qualities of the picture.

Mr. F. Thurston sends "Frosted Trees" (36), and Mr. Charles E. Abney shows several views of Derbyshire and Wales; of these, "The Derwent at Duffield" (46), in which the wealth of foliage above the placid river is managed with much taste, will find most favour. Miss Miles, of Bristol, has but one picture (50), and a very good one it is, an interior with four massive vases, rendered with much harmony; while clear and bright, it is yet devoid of glaring high-lights. Mr. Frank M. Sutcliffe's "Moonshine" (51) is particularly good, a forest of shipping fitfully illumined; and so is "Stuck in the Mud," a huge black craft on her side, depicted with much force and vigour. Mr. Bracebridge Hilditch sends "St. Paul's" (53), a small picture, hung some fifteen feet from the ground, and two Thames studies (529, 530). Cattle in river (56) is one of the best contributions by Mr. James M. Nisbett, who has also some lively views of the sailing barge race on the Thames (116), the black-sailed craft on the rough water making a forcible picture. Mr. J. Cowell's "Peel Harbour" (59) is too high for recognition, but other pictures of the Isle of Man (463, 466) include some excellent examples of work. Mr. W. Gillard is represented by a study of cattle (60A), and "Marion" (412), a picture of a pleasant face. "The Mill at Blackpit (63) we prefer of Mr. Edward Brightman's series; it is a group of white cottages with foliage beyond, and a rough country cart in the foreground. "Dora" (64), a young lady among ferns and brambles, is also a happy picture. The School of Military Engineering at Chatham, as usual, makes a bold show of good work. "Stybarrow Crag" (72), an old acquaintance of the photographer, is done full justice to by our Sappers, who have represented the rocky eminence in its bowery retreat with much refinement; but the tone of the pictures is a little too warm to please us. Lieutenant Darwin, R.E., who is at the head of our soldier photographers, sends some prints in his own name; in "Farm Cottages, Coniston" (73), the dark spreading cedar is a charming study, while a better bit of work still of the honorary secretary is a lake picture (296) termed a "Free Study," in which clustering summer foliage sweeps down to the water's edge, and overshadows its placid surface.

Mr. Seymour Conway makes good his position of last year. "Scarborough from the Sands" (71), showing the Grand Hotel and other buildings on the heights, is like a bijou engraving; the pearl-grey half-tones, and the soft, clear shadows, are delicate and fine to a degree. On the opposite wall, too, among the "relics of a bygone age" (258) the picture of "Riebaux Abbey" is exquisite, the ivy-grown ruin being a study of harmonious photography. Mr. H. A. H. Daniel, the honorary secretary of the Bristol Association, also deserves honorable mention among our capable amateurs; in his treatment of leafy nature and wood and water he is exceedingly happy; of his series this year we prefer "Woodside Lynmouth" (293), a pathway beside a tearing torrent, with cottages on the opposite shore, half-hidden in luxuriant foliage.

Mr. B. B. Turner's best contribution is "Rivage Dinant on the Rhine" (208), a quaint village street made up of houses and tall rocks. Of Mr. J. Duncuft's series, "Scene in the Fjord" is the most taking picture, the sweep of the heavy sea, the dark viscid water heaving without breaking, being as powerful as it is unconventional. Mr. T. M. Brownrigg sends a delightful collection of landscapes; the "High Tor" (84), in which the lofty rock is shown towering above the tree-fringed Derwent, is exceedingly successful, while, to cite another class of work, the "Thames near Purfleet" (90), in which the massive Dreadnought hulk is shown surrounded by the cobweb rigging of innumerable craft, is not inferior. We are sorry to say it, but we do not like Mr. Arthur Reynolds' "Irish Scenes" (93, 94), comprising make-beliefs of drowned and murdered people; "Looking out to Sea," in which we behold the backs of half-a-dozen personages, is the only redeeming feature of the frames, and the idea here is so quaint and ingenious that we hope Mr. Reynolds will give up lugubrious subjects in future for such as this.

The Autotype Company make a brave show, not the least uninteresting being a frame of Collotypes, "Views from Nature" (133), which shows that in this country mechanical printing is cultivated to some purpose. There are many magnificent examples of so-called Lichtdruck here. The Company also show some fine carbon portraits from negatives by Messrs. Downey, which really leave nothing to be desired, 200 and 201being particularly good; of architectural subjects, the grand five-foot picture of Holland House, showing the whole front of this magnificent pile, standing on its terrace pedestal, is a master-piece. There will be a great demand, we feel sure, for these "Ancestral Homes of England" if produced upon this perfect scale; the engravings on our dining-room and library walls will soon be replaced by photographs if pictures of this stamp are forthcoming.

Lieut. White, R.N., sends some excellent results of torpedo explosions (98); the explosions are evidently the results of small charges sunk not far from the surface, for the tall and elegant fountain of water proclaims a sharp discharge with little resistance. The firing of a gun from H.M.S. *Cambridge* is also both clever and effective. Mr. J. Thomson, F.R.G.S., whose magnificent China photographs are so well known, this year comes forward with a series of what he terms "At Home Pictures"; the Queen at Osborne House (100), with a fine dog at her feet, is a good specimen of Mr. Thomson's home picture; as also is the Princess Beatrice standing beside a marble mantelpiece in the Palace. These are drawing-room pictures, and not studio pictures, be it remembered, and Mr. Thomson is to be congratulated upon overcoming the obvious difficulties of the situation so well and so satisfactorily. The studies of children that Mr. Thomson sends are full of life and reality; one of them, the "Picture Book" (515), has been secured by the *Illustrated London News* for engraving.

Messrs. Marsh Brothers' hunt pictures (117) are good, but their best contributions are the fuming and fretting little pigeons (235) which deck the opposite wall. Captain G. H. Verney sends a large number of prints, some of them very fine; the "Pont du Gard," for instance, its grand heavy masonry singularly well lighted and treated, deserves high praise, and so too does the view of Mentone; the lofty old houses on the quay, crowded together cheek by jowl, make up a most effective picture, harmoniously rendered, without the inky shadows or glaring high lights so difficult to avoid in a Mediterranean sun. Mr. Richard Keene's "Aspens" (132), the tall graceful trees limned with much delicacy, we prefer, as photographic work, to anything in his views of Derbyshire, &c (432). Mr. Arnold Spiller shows the Old Mill Dam, Swanage (126), and a few other little sketches; the Dam is a capital picture, the quaint cottages around being depicted with much taste and skill, while there is that quiet harmony throughout that always marks a good landscape photograph.

Messrs. W. Cobb and Son, of Woolwich, are represented by much good work; some winter scenes by the riverside, huge crystalline masses of ice and snow, are here (134), together with several fine pictures of the busy Thames, alive with huge steamers and swift shipping. Another frame contains Summer Views (217), taken off "A Steamer going twelve knots an hour." At the other end of the room Messrs. Cobb also have some characteristic studies (386), of which we like "A Difficult Problem" the best. Herr Emile Selig shows some pictures of Wilhelmshöhe (139), and Cassel (493); and Mr. F. Salis Schwabe contributes some excellent coast scenes (207).

SEASONABLE HINTS TO EMULSION WORKERS.

THE time of year has arrived when gelatine emulsion plates can be most easily made, and when the photographer who manufactures his own plates may with advantage turn his attention to the preparation of a sufficient stock to last him during the summer.

We have from time to time given methods whereby satisfactory emulsions can be made even in the hottest weather, but there is no doubt that the best plates can only be made with certainty when the weather is cold; besides, at this season photographers have far more leisure than in the summer months. Again, if a number of emulsions be made one shortly after another, the photographer gets his "hand in," and performs the various manipulations with greater ease than if he makes an emulsion only now and then, when he requires to coat plates for immediate use.

We are writing just now for the benefit of those who make a comparatively small quantity of plates at a time, whether they be professional or amateur photographers; but we have often wondered why the commercial plate maker does not manufacture during the cold months a reserve which would make it unnecessary for him to turn out inferior plates during the very hot weather, as most do. We have now had sufficient experience to know that, if reasonable care be taken, there need be no fear as to the plates keeping.

It is a question of some importance what quantity of emulsion is to be made at a time. Of course, with beginners, a small quantity only should be attempted, as losses are so frequent; but with the amateur or professional photographer who is pretty confident of success, it will be found most satisfactory to make a good deal at a time. Not only is the loss proportionately much less, but it is always easier to make a pint or a quart of emulsion than a smaller quantity, whilst half a gallon is not too much after a little practice. Beyond that quantity special appliances are necessary, and it would be scarcely worth the while of most photographers to purchase these.

Dry plates are now to be had much more cheaply than formerly, and some of the cheapest makes are undoubtedly as good as the most expensive. This makes it very doubtful whether, if loss and labour be taken into consideration, it is possible for a photographer who makes his own plates to make them as cheaply as he can buy them. Whether he can or not, however, there can be no doubt that there is a certain satisfaction in the use of one's own plates, and that one looks more tenderly on a negative produced on one of them than on a commercial plate. Besides this, one who has never manufactured emulsion cannot have the same mastery of the use of dry plates as one who is familiar with the manufacture.

It is customary during the cold weather to use only a soft gelatine for emulsions, but we cannot agree that this course is the best. Certainly plates can be made entirely from soft gelatine when the weather is cold, and such plates develop with extraordinary rapidity; but we do not consider this by any means a great advantage; whilst if a supply be made to last through the summer, as we propose, it is evident that soft gelatine alone must not be used.

We have tried the new Swiss gelatine which Dr. Eder first mentioned, and can confidently recommend it. The Autotype Company manufacture another excellent hard—or, rather, stiff setting—gelatine. Either of these used with an equal quantity of Nelson's No. 1 will give an excellent film.

It is advisable to add a small quantity of chrome alum to the emulsion to still further harden the film, and to prevent frilling. This makes the plates take somewhat longer to develop, but does not, as many suppose, slow them. The quantity required varies with the gelatine used. If too little be added, the desired effect is not brought about; if too much, the film is rendered so hard and so repellent of the developer that it is impossible to gain density enough in the negatives. With the mixtures of gelatine which we have given, one-tenth of a grain of chrome alum to the ounce of emulsion will be sufficient.

If it be intended to keep the emulsion for any length of time before coating the plates, about a grain of salycilic acid should be dissolved in alcohol and added to each ounce of emulsion. We should recommend that a stock solution be mixed in the following manner:—Dissolve eight grains of chrome alum in three ounces of water; dissolve eighty grains of salycilic acid in five ounces of methylated spirit. Mix these two solutions, and of the stock solution so produced add one ounce to each ten ounces of emulsion just before filtering.

As regards the best material to filter through. We have tried everything recommended, and found the process with each of them to be a most tedious one, till the "happy thought" struck us to use a cambric pocket-handkerchief. The emulsion will run through very quickly, it will be thoroughly filtered, and if the handkerchief be rinsed in hot water before the emulsion left on it has dried, it will be none the worse.

Captain Abney pointed out some time ago that emulsions increased in sensitiveness by keeping, and there can be no doubt that whatever process of manufacture be resorted to, the emulsion will become more rapid after several days' keeping; but we would point out that an emulsion that has been so kept must not be strongly heated, or it will fog.

The cause of increase of sensitiveness through long keeping has not been determined, but it seems likely that a small quantity of free ammonia is given off in the emulsion, and that, in fact, the process is one of very slow digestion in the presence of a very minute quantity of ammonia. If this be the case, it can be easily understood how, the restraining bromide having been washed away, heating the emulsion to a high temperature will cause fog. We would recommend that, whilst coating the plates, the emulsion should not be heated much above 100° Fah., and that it be not kept longer melted than needful.

A certain thickness of film is quite necessary to be able to command any density that is wished. Of course the quantity of emulsion required varies according to the amount of bromide of silver in the emulsion, but with an emulsion of average strength not more than three—or, at the outside, four—half-plates should be coated with each ounce of emulsion. About five grains of nitrate of silver should go to make up the emulsion to coat a half-plate.

The drying of the plates is one of the most difficult parts of the manufacture; in fact, it may be said that the real difficulty in making satisfactory and *clean* dry plates only begins when the emulsion has been made.

Frilling probably may arise from many causes, but one of them undoubtedly is drying at too high a temperature without a sufficient current of air; another is insufficient desiccation. What is most required in the drying room or box is a strong current of air, the temperature of which should not be allowed to rise above 60° until the plates are apparently dry. If, however, there be the faintest suspicion of dampness, the plates should not be packed immediately they seem dry, but the temperature should be raised very considerably for an hour or so. Gelatine has a powerful affinity for water, and it is evident that a cold current of air, not absolutely dry, passing over the plates, will not eliminate all the moisture. We therefore recommend that the drying be carried on at a temperature of about 60° till the plates appear to be dry, and that after that the heat be raised as high as it conveniently can for about an hour, and the plates be then immediately packed up. By this means both dangers—that of drying at too high a temperature, and that of incomplete desiccation—will be avoided. There is no doubt that insufficient desiccation is one cause of another evil besides frilling, and this evil is green fog.

AN EXHIBITION OF PHOTOGRAPHIC APPLIANCES.

Technical exhibitions now appear to be quite the order of the day: and it seems just as reasonable for the photographer to have an opportunity of making himself familiar with the apparatus and appliances used by his brother practitioners, as that the millers, printers, leather dressers, brewers, electricians, and others, should hold exhibitions illustrative of their own special branches of industry.

A short time ago we gave publicity to a circular issued by the Secretary of the Society of Arts, in which a proposal is made to hold a Photographic Technical Exhibition early next year, and we are happy to be able to say that this scheme seems likely to meet with such cordial support from the photographic world as to ensure a most satisfactory result.

It is, we believe, intended that all classes of photographic instruments and accessories should be included and fairly represented, so that not only the landscape photographer and portraitist, but also the photo-lithographer, and even that active and enterprising gentleman who takes one's portrait at the seaside for sixpence, may find matter for study and reflection; while the numerous body of artificers engaged in industries collateral to photography cannot fail to profit considerably by such an exhibition as is now projected.

The time for holding the intended exhibition is very appropriately fixed so as to coincide with Captain Abney's course of Cantor lectures on "Recent Improvements in Photography," in order that those attending the lectures may have an opportunity of profiting by a study of the exhibition. A somewhat analogous arrangement was carried out when, in 1869, Mr. Davenport, the late financial officer of the Society, read a paper on "Prints and their Production"; the extensive collection of specimens being formed into a kind of temporary exhibition.

A recent "By-the-Bye" refers to the desirability of instituting in this country some kind of a permanent collection of photographic curiosities, and mementoes of the early days of photography; and it appears to us that the Society of Arts would be doing an excellent work if they were to follow the example of the directorate of the *Conservatoire des Arts et Metiers* in Paris. The permanent photographic museum might easily follow out of the proposed technical exhibition, and were it known that such a scheme was contemplated, there can be but little doubt that many of those possessing specimens illustrating the rise and early progress of the art would willingly part with them; and renewed efforts might bring to light some of the lost Niepcotypes and other rareties. We know that the South London Photographic Society possesses a few specimens which would be of considerable interest, but these are at present locked up in a box, and are scarcely ever looked at, while even their existence is unknown to many members.

It would be highly interesting to make a tolerably complete collection of photographic lenses, ranging from the early uncorrected meniscus to some of the remarkable triumphs of optical skill which are produced now-a-days.

We commend the notion of a permanent photographic museum to the consideration of the Society of Arts, and earnestly hope that some action will be taken in the matter, especially as the difficulty of obtaining the required specimens becomes greater and greater every year.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

A Singular Photograph—Gelatinizing Prints—Photography and Politics.

A Singular Photograph.—About the oddest instance of the use of instantaneous photography comes from America. A mule at Willett's Point Engineering School being past work, it was determined to kill it; but, in the utilitarian spirit which marks the American mind, even its death was to be made the vehicle of instruction to the military class. Accordingly the mule was placed before a camera and duly focussed, and on its forehead was then tied a cotton bag containing six ounces of dynamite. The slide of the camera was supported by a fuse which was included in the same electric current with the dynamite. Thus, in passage of a current, the camera slide and the head of the animal fell nearly at the same instant, and the result was a picture of the headless creature still standing, before its head had time to fall. We are not quite sure what useful military purpose is served by photographing a mule about to have its head blown off, but the incident suggests that photography might be made use of to a far greater extent in surgical operations, and—if we may venture to mention the debated subject—vivisection, than it is.

Gelatinizing Prints.—To the general public a highly-glazed surface on photographs is very attractive; whether it is artistic is another matter. Those who care to try an easily worked process may find the following hints by Mr. J. A. Scholten, of New York, useful. Mr. Scholten recommends for a fine finish plate-glass, although the first quality French negative glass will answer. The glass is to be cleaned in the usual way, and then, with a piece of cotton wool, go over it with a little prepared chalk. Dust the plate with a brush, and gum the edges with any kind of gum. Before the gum is perfectly dry, collodionize the plate with plain collodion, and dry. The next thing is to soak, for one or two hours, one ounce of white French gelatine in eight ounces of water, and dissolve fully by heat. While hot, strain through a piece of muslin into a small porcelain dish. Immerse the print in this solution, and when well saturated take it out, scraping the back of the picture over the edge of the dish to avoid waste. Place the print down on the prepared plate, and press out the air-bubbles by means of a piece of sheet India-rubber five inches long and two and a-half inches wide inserted into a handle on the principle of the squeegee. When the picture thus put on the glass is nearly dry, damp a piece of Bristol board cut to size, paste on one side, and put it over the print, pressing well down with the scraper, especially the edges. After thirty-six hours, or when perfectly dry, with the point of a knife cut the picture along the edge, leaving about a quarter of an-inch strip, and raise the picture slowly; then trim to size, and gum the edge only. Place down on the card, and for a weight cover it with the same glass from which you cut it, or any piece of glass that is straight and clean. One or more prints can be placed on the same glass, only they must be kept from the edge half an inch or so. If the picture leaves the glass quite clean, you can use it again without re-cleaning.

Photography and Politics.—Photography probably plays a far more important part in modern politics than it gets credit for. Familiarity with the features of celebrated men does not, as it does in so many other things, breed contempt. A daily paper has lately remarked that "it is worth noting that the photographer's art has contributed much to make our public men in the minds of the multitude no longer mere names, but familiar entities. Never, certainly, were the features of distinguished persons so widely known as they are now-a-days." This is perfectly true, and when one comes to think of it, it is evident a new duty is imposed upon our public characters, which it must be owned they are as a rule perfectly alive to. To destroy the public idea of a face is to affect the popularity of the owner; therefore, public men should beware how they interfere with the fashion in which they wear their hair. Had the late Lord Beaconsfield shaved off the characteristic tuft on his chin, or did Mr. Gladstone cultivate a moustache, all the individuality would be at once gone, and their admirers would be certain to resent such rash alterations. And this is not all; negatives of almost priceless value to photographers would become comparatively worthless, simply by the addition or subtraction of a moustache. Some time ago, Mr. Parnell gave an infinite amount of worry to artists by the continuous changes to which he subjected his hair. It was never the same two months together. He would be seen one week with his hair and beard quite long, and the next week his hair would be cropped close to the head, and his beard shaved off. As a matter of fact, portraits of the President of the Land League appeared in two illustrated papers in the same week, and were diametrically opposite, and yet in each case the artist had gone to photographs. President Grèvy appears inclined to give French photographers the same trouble, for he has allowed his beard to grow, and is scarcely recognisable. This is really a serious matter for photographers, and the necessity for adhering to one style ought in their interests to be firmly impressed on the minds of our statesmen and rulers.

At Home.

HERR TH. PRÜMM, UNTER DEN LINDEN, BERLIN.

Unter den Linden! We have a grievance, and we mean to set it down here. It concerns the Linden or Limetree Avenue that give their name to the most famous thoroughfare in Berlin—nay, in the whole Fatherland. Ten years ago we paced the flags of the capital under the same sense of injury, and to-day the trees appear even smaller and slighter than they did then. Only fancy a wizen plantation of pigmy trees with stems that you might clasp almost with your hands, and not an offshoot that is worthy of the name branch, after you have been dreaming of a mighty avenue with shadowy over-spreading foilage, lofty tops reaching to the sky, and massive translucent greenery redolent with the sweet perfume of the lime blossom! All this and more does the name "Unter den Linden" call up in the traveller's mind; he fancies himself walking under shadow of big green boughs where the glaring sun and blinding white dust cannot reach him, where comfortable seats offer cool repose, and where he may find a soothing retreat after the busy turbulent streets of the metropolis. Visions of lofty limes he has seen elsewhere haunt his memory, and he hopes for something that shall combine the sylvan attractions of Hyde Park with the brightness and sparkle of the Boulevart des Italiens. Alas! when he looks upon the reality, he finds that the only thing romantic about Unter den Linden is its name, and that the green glades and arcadian paradise exist only in his imagination.

We must, however, be fair in our criticism. Having now aired our grievance, it behoves us to admit that it is the name, and the name only, that causes disappointment. Unter den Linden, from the famous Brandenburger Thor to the Palace of the Emperor, is a magnificent thoroughfare, and well worthy of its capital. There are fine public buildings and bright shops throughout its entire length, and as a fashionable promenade it takes rank with the chosen spots of Paris and London which we have just named. In one of the best positions in Unter den Linden we find Herr Prümm's studio, and as it is one of the two leading establishments we have selected to visit, in order to give our readers an insight into the studios of Berlin, we make our call, and are fortunate enough to find the principal "at home."

In Berlin, the high class studios differ slightly from those elsewhere. There is no reception room, in the way in which we usually understand the word. There is rather a counting-house, fitted with elegance and taste, and one or more waiting rooms, also well-appointed, but not making the same display of specimens as is usual with us. The difference is very slight, but still there is the difference; the customer usually comes to some understanding in the ante-room, or comptoir, as to the nature of his wants before entering the waiting room.

Below, and also on entering the studio, a printed notice informs visitors that the studio is open from 9 to 6, and from 9 to 2 for taking of portraits. The same arrangement—not to take portraits after 2—we noticed in other establishments; and although the photographer has at times to go beyond the rule, the regulation is a very good one for two reasons: in the first place, work is not carried on after the best of the light has gone; and secondly, the photographer is released after a sufficient spell of labour. The public, too, are taught to come betimes, and thus a good deal of hurry and haste is avoided.

To Herr Prümm we have much to be thankful for. It seems to strike very few that journalists are sometimes busy men, and that their time is valuable. In our own case, and especially when we have travelled some hundreds of miles to pay a visit "At Home," there is often but a certain narrow and fixed limit of time in which to make a call; and yet our friends apparently conceive a notion, at times, that we are going to settle down among them, and that whether we delay our visit till next day or the day after, is immaterial. Herr Prümm was very good in this respect. He bade us welcome at once; he was actually guilty of keeping a sitter waiting some minutes in order that his reception might not seem to lack warmth, and for this attention, as well as for his generous hospitality, we cannot enough thank him. Our only hope is that in comparing notes in the theory and practice of photography he may have benefitted in some slight degree by our conversation, as we believe our readers will benefit by our brief description of his compact and elegant little studio.

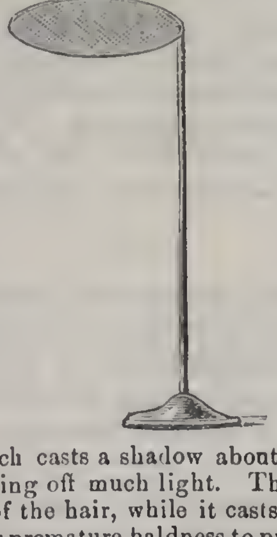
Herr Prümm's bargain with the public is, that they pay half the amount only of the order at the time it is booked, and this condition is posted up in plain characters in the studio. It is the best arrangement that could well be devised. No doubt to pay the whole amount is wise under some circumstances, but it not unfrequently happens that the sitter would give a bigger order if it were not for the fact that he hesitates to disburse a large amount at the outset. Moreover, the *half* is a fairer transaction towards the public. In any case, Herr Prümm has found out the advantage of such payments, and he proposes to keep to it. His customers are numerous, and of the highest class, and there is, perhaps, no photographer who is so successful in producing vignetted baby portraits as our kindly host in Berlin. The poses of the little sitters are quite humorous from their sprightly and natural character, while the soft style of the negative and of the print are thoroughly in keeping with the subject.

While speaking of the sketchy harmonious character of Herr Prümm's vignettes, we may mention how they are printed. "You will see how fast it goes, if you will come out upon the roof," says Herr Prümm, and we follow him. The printing is not done under glass, but the frames are simply laid upon upright stands, which are not placed in the shadow, but merely turned away from the sunlight. There is not that loss of power which is sometimes very great under a roof or in a sheltered recess, and the consequence is that a dozen prints may be produced on a bright day. Most of the delicate vignettes have a piece of fine tissue paper laid over the frame, and during the printing the frame is occasionally reversed, but otherwise no particular care is taken. "I have tried many ways of printing, but have always come back to this simple plan. Once, at the suggestion of a friend, I had a series of planks nailed to the printing stand, so as form recesses for the frames, and only allow parallel rays to strike them; but the result was to produce very hard negatives," says our host. In Herr Prümm's establishment—as, in fact, throughout Germany—lavish use is made of carmine, with which to cover the weak parts of a negative; the red solution is simply applied in patches on the back of the negative, and thus modifies the action of the light.

There is not a single painted background in Herr Prümm's studio. Indeed, there was only one practical background of any sort that we saw, this being apparently a solid screen on castors, one side of grey cloth stretched flat, and the other side shaped convex, or alcove form, which would naturally give a darker ground. We say the screen was solid, because it seemed so; but when we touched it, it was so light and mobile, as to be easily moved with one hand. But in his pictures, Herr Prümm usually employs the end studio wall as background; he uses, in a word, a real wall, properly decorated, of course, together with ordinary chairs, tables, and other furniture. In effect, Herr Prümm neither makes use of background nor accessories in the ordinary acceptation of the term, but photographs his sitter as if the latter were in an ordinary room among ordinary furniture.

The curtaining of the studio requires no remark, nor the mode of lighting. On the walls are some attractive pictures, one of them a humorous sketch by Hans Hartmann—of the well-known firm of Loescher and Petsch—who has done his best to put sitters in a good temper by depicting an improvised studio in the backwoods among the Indians. Where tatooing is the custom and scalping of every-day occurrence, one naturally expects apparatus to be a little rough, and we are not surprised, therefore, to see an ochred visaged model, standing against a tree, whose head is kept firm to the stem by the aid of a long corkscrew, which, after piercing the wood, is made to enter the Chickachaw's cranium. With such an awful example before them, sitters in Herr Prümm's studio are not likely to cry out against the European head-rest, which, by good fortune, has fallen to their lot, instead of the primitive apparatus of the prairies.

A simple head-screen deserves mention. It is merely (see fig.) a round diaphram, about two feet in diameter, of violet gauze, which casts a shadow about the head of the sitter without cutting off much light. The screen does not darken the tint of the hair, while it casts sufficient shade over the parting or premature baldness to prevent these being exaggerated in the photograph. The screen stands scarcely six feet high.



"This series of prints on the wall are all taken on gelatine plates," says Herr Prümm, pointing to a fine collection of brilliant cabinet pictures. We ask our host if he still uses emulsion. "I employed nothing else for five months during the last autumn and winter, and would have been glad enough to continue. But there were two reasons against it: in the first place, I could not get uniform films, not so much as regards sensitiveness, as in respect to thickness. I was plagued with a lot of thin films, and in these I found the bromide was generally thrown down in tiny black spots, as when an old silver bath is used in the wet process. In the second place, I find my wet plates work fast enough in summer, and I have no occasion for more rapid exposures." Herr Prümm employed oxalate development throughout, and was good enough to show us some plates taken on a summer tour in Switzerland and on the Stelvio Pass, whence he had just returned.

To the matter of washing, Herr Prümm devotes considerable care. He makes it an invariable rule that each print shall be taken up separately by the assistant and washed by hand in eight changes of water, after which the picture is thrown with others in running water for the night. In the morning the prints are again separated and rinsed one by one by hand. "Those prints of mine in the show-case have now been there two or three years exposed to all sorts of weather; they have never once been tampered with, and yet there is not a trace of yellowness to be found.

At Herr Prümm's establishment the charge for a dozen cartes is fifteen marks or shillings, while half-a-dozen cabinets are charged the same, and these prices may be regarded as those of all first-class studios in Berlin.

The "By-the-Bye" next week will be, "On Tripods"; the following "At Home" will be, "Dr. J. M. Eder at the Imperial Technical Academy, Vienna."

◆

Notes.

Dr. Hermann Fol, of the University of Geneva, promises us a paper shortly on "Photography in Coloured Lights."

Another note from the Exhibition. "Photographers are humbugs," was a lady visitor's remark at the soirée; "they make all these pretty things, and yet when you go to them for a portrait they always disappoint you."

Major Waterhouse, the Deputy Surveyor-General of India, is so pleased with the working of the velvet roller in photo-lithography that he is making comparative experiments with similar implements. Rollers constructed with silk velvet, cotton velvet, and moleskin are under trial, and the results we hope shortly to put before our readers.

The comparative amount of silver expended in the collodion and gelatine processes has already attracted the attention of photographers, and we are glad to announce that Dr. Eder, who has been working on this subject, promises to send us his results next week.

Herr Otto Pfenniger writes from Switzerland on the subject of the ceramic portraits we recently saw in Lucerne churchyard. "The portraits are burned in on porcelain, and are now to be seen in many of our Swiss graveyards. Two firms, I know, supply them, namely, Emil Oertel, of Coburg, and Albert Fischer, Hirtenstrasse, Munich; but it is very possible that the photographs are not made by them, but come from Meisen in Saxony, the manufacturing district for porcelain." These white enamel portraits let into blocks of polished black granite are both chaste and effective.

Lieutenant White, R.N., who sends some elegant pictures of torpedo explosions to the Exhibition this year, is the temporary commander of H.M.S. *Polyphemus*, the new war-ship that carries no guns, and is to do battle under the waves instead of above them.

In Berlin, the hours of assistants are from eight in the morning until seven in the evening, one hour and a half being permitted for dinner. The printing staff, however, usually begin work at seven, and end at six.

"Don't talk to me!" cries Miss Kate Vaughan, with an air of pride, in the "Forty Thieves;" "I've been photographed upon a swing." Messrs. Downey, proud as they are of their accessory, could hardly have supposed that it conferred social standing.

Mr. Michael Gunn, one of the proprietors of the Savoy Theatre, tells us that by employing a heavy fly-wheel weighing several tons, they hope to establish a more uniform "grinding out" of electricity to feed the multitude of Swan lamps on the stage. The permanent illumination of this and all other theatres by electricity is, in his opinion, not a matter of years, but months.

We were present at the opening of the Royal Comedy Theatre on Saturday. Electric illumination is here not only under discussion, but most of the scenery has been painted with a view to it. Fortunately for the photographer, his scenery and accessories are painted for daylight, so that when he introduces electric lighting in the studio, there will be no reason for a change.

Touching the question of electrical lighting, the *Daily News* treated us the other day to a long eulogium upon Mr. Edison and his works. Anecdotes about his youth are forthcoming, and, to show his early perseverance, a story is given of his fighting a gander, and sitting day after day upon the eggs of a goose, endeavouring to hatch them. Then we have a graphic description of the immense laboratories at Menlo Park, of the labours of himself and a numerous staff who work for the pure love of science, and of the tedious research which ended in the little paper horse-shoe which, when burnt in the Edison lamp, enabled the inventor at last to cry "Eureka!"

We are quite willing to believe all this, of course, only we do not see the importance of proving that a successful inventor has been clever in his youth. As matters at present stand, despite the sensational cablegrams coming repeatedly from America, several inventors in England and France—Mr. Swan among others—have shown much better results than Mr. Edison, whose vaunted paper horse-shoe was only discovered after Mr. Swan had done so. Again, since Mr. Edison is the reputed owner of shares in various American companies of the nominal value of a million sterling, his pure love of science has certainly been turned to account; so that there only remains the gander story, which, whether true or not, is a very silly one.

Is a changing-box for dry plates of any value? On the Continent, many seem to think so, for considerable ingenuity is devoted to their construction, and they are to be seen at every maker of apparatus; but with us they find little favour. There are few out-door photographers who have not, at some time or other, devised some clever form of changing-box; but the design rarely goes beyond the drawing. "I have received a dozen such designs in a week," an experienced camera-maker once told us, when we unfolded a new plan that was to make the photographer the most independent of men. "Is it impracticable, then?" we asked. "Not at all," was the reply; "only I will guarantee to make you slides to hold as many plates for two-thirds the price and two-thirds the weight.

———

This, then, is the reason why English camera-makers rarely construct changing-boxes. Six double-slides are lighter, cheaper, and more easy to manipulate than a changing-box to hold a dozen plates.

Topics of the Day.

COLLODIO-CHLORIDE EMULSION FOR DEVELOPMENT.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

Dr. Eder, as we see by the last few numbers of the News, has given a most satisfactory formula for making gelatined chloride emulsion plates, and he has also shown us how to develop them. I now give a formula for collodio-chloride emulsion, and also the method of developing plates coated with it. There are two formulæ which I might give, one with excess of silver, and the other with an excess of chloride. For most purposes the latter is the one I prefer, since it can be made and used in a quarter of an hour when required. I may here say that what is usually called collodio-chloride is totally unfit for chemical development (to adopt a term used by Dr. Eder), and it is, as I have said before in other terms, misleading to call it collodio-chloride, since it has a large proportion of citrate in its composition. To make the collodio-chloride we proceed as follows:—

Weigh out the following—

Pyroxyline (any easily soluble sort) ...	10 grains
" " " " " ...	5 "
Calcium chloride	20 "
Silver nitrate	50 "

Dissolve the calcium chloride in ½ ounce of alcohol ·805, by warming over a spirit lamp. Place the 5 grains of pyroxyline in a 2-ounce bottle, and pour on it the alcohol containing the calcium. After a couple of minutes add ½ ounce of ether, when the cotton will dissolve.

Dissolve the 50 grains of silver nitrate in a test-tube in the smallest quantity of water, and add to it 1 ounce of boiling alcohol ·805, and mix. Previous to this the 10 grains of pyroxyline should have been placed in a four-4-ounce bottle, and the alcohol containing the silver should be poured on it. Next add 1 ounce of ether, little by little, with continuous shaking. The silver nitrate may very probably partially crystallize out, but that is of very little consequence. Take the two bottles into the dark-room (a room glazed for wet-plate work will answer perfectly), and *pour gradually the calcium chloride collodion into the silver nitrate collodion*[*]—on no account *vice versa*. The resulting emulsion, of course, is silver chloride in an extremely fine state of division. A plate coated with it should show daylight as canary-coloured, and a thickish film should make a gas flame appear ruby-coloured when examined through it. The emulsion may be washed in the usual way, if required; but when washed, and used simply dried after washing, it is, like other collodion emulsion prepared with an excess of haloid, rather insensitive. Before doing anything with the emulsion, however, a plate should be coated, washed under the tap, and placed in the dark slide. The slide should be taken into white light, and half the front pulled up for a second, and then closed. Ferrous-citro-oxalate developer, as given in the last number, should then be applied, and the result noted. With two lots of emulsion I made, the only thing I noted was a blackening all at once of the film, and no doubt those who try this method will find the same result. The first lot I made was perfectly clean, and without any reduction of the chloride (except on the exposed half of the plate) on the application of the developer. The question resolves itself into this—how to cure an emulsion which fogs. You may add nitric acid, but that rather rots the film if kept long in contact with the emulsion. A simpler plan is to add a chloride which can form a double chloride. Having at hand cupric chloride (chloride of copper) dissolved in alcohol, I dropped 3 or 4 drops of a 20-grain solution into the emulsions, shook up, and immediately the fog disappeared, as a trial plate showed. Two or three drops of chloride of gold or cobaltic chloride solutions would answer equally as well as the cupric chloride, for the reason just given.

So far, as regards the making of the emulsion. The next point is the preparation of the plate. As was said before, it can be washed, but I really see no advantage in so doing. I have coated plates merely polished and edged, washed them, and then simply flooded them once over with—

Beer	5 ounces
Sugar (white) ...	1 moderate sized lump
Pyrogallic acid	5 grains

These when dry were admirably sensitive, and would put to shame many a collodio-bromide emulsion which I have tried. To develop them, rinse them under the tap, and then simply immerse them in a dish containing the ferrous-citro-oxalate.[*] In a short time the image will begin to appear, and gradually gain strength. The colour of the image is a beautiful ivory black, and admirably suited for collodion transfers. If a warmer tint is required, tone in a dish with—

Uranium nitrate	10 grains
Ferricyanide of potassium ...	10 "
Water	10 ounces
Gold chloride	½ grain

The colour will rapidly warm up the image, and will eventually become a pretty chocolate colour if sufficient time be given it.

It will be noted that an emulsion prepared in this way may be developed by the ferrous-citro-oxalate *without any restrainer*. Dr. Eder recommended the development of gelatine plates with hydrokinone with a solution of carbonate of ammonia and some soluble chloride. These plates develop with the same, but the chloride may be omitted. For immediate use in the camera, the plates need only be washed well under the tap, and exposed wet.

I shall return to the subject of collodio-chloride emulsions in a subsequent article, meanwhile advising those who are fond of a pretty process to try the one I have described.

———

The "Topic" next week will be "Cheap and Effectively Finished Enlargements," by George Croughton.

---

[*] I wish the printer could doubly italicize this sentence; it is deserving of capital letters.

[*] See Photographic News, p. 483.

A COMPLETE ELECTRIC LIGHT APPARATUS FOR PHOTOGRAPHIC PURPOSES.

BY A. J. JARMAN.

For some time past it has been the desire of many photographers to have at hand a ready means of producing a powerful and highly actinic artificial light, suitable for the production of negatives, and easily controllable. Several forms of apparatus have been designed, and I believe have been, to a certain extent, employed successfully in portraiture. But it has been well known for many years that the electric light was just the light that would answer the photographer's requirements, owing to its possessing great actinic power; but the cost of its production was too great for general adoption; indeed, such might be said of it now as far as dynamo-electric machines and steam or gas motors are concerned, for the majority of photographers. It is true that several influential photographers have already adopted the use of the electric light for portraiture, but the primary cost of the apparatus employed by these firms is far beyond the reach of most portraitists. The apparatus about to be described is one that has been carefully worked out to meet the wants of the photographer in almost every particular; in fact, with this apparatus, portraits can, and have been, produced in an ordinary sitting room, as good and as perfect as if taken in a well lighted studio.

The generator of the electric current consists of a series of voltaic elements of zinc and carbon—forty-eight in number—these elements being made up of ninety-six zinc plates and forty-eight carbon plates; thus the generator consists of forty-eight voltaic elements arranged in rows of twelve; they are all carefully screwed upon suitable bars of wood, and these bars are joined by other cross-bars, which bind the whole in a compact form; the battery being suitably connected so as to produce a current of very high electro-motive force, and so arranged over their exciting trough that the plates can be raised or lowered at will, as seen in fig. 1, which will explain itself almost at first sight.

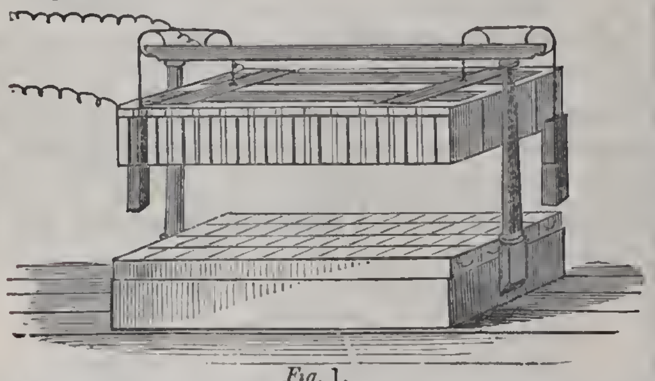


Fig. 1.

The troughs are made of mahogany put together with brass screws, and well saturated with an insulating compound which also makes them acid-proof; the cells are charged with a saturated solution of bichromate of potash, to which has been added twenty fluid ounces of sulphuric acid to each gallon.

To produce the electric current, all that is needed is to lower these suspended elements down into the trough, having previously connected the wires as shown in fig 1 to the electric lamp, fig. 2. At once a light starts up, between the carbon pencils, of a thousand-candle power or more. With a light of this power, a large head on cabinet or carte size plate may be produced in three or four seconds.

The generator occupies a floor space of three feet six inches by two feet, and stands two feet six inches high. The cells will cost 5s. to charge, and will produce upwards of sixty negatives before being exhausted. All that is necessary, in re-charging, is to lift the elements up out of the way, take out the troughs by their handles and empty them, charging them again by means of a toilet jug. When replaced, the whole apparatus is fit for use again; the whole of the above operation occupies but a quarter of an hour, and as there are no earthenware cells employed, there is no fear of breakage.

The small amount of labour and cost of working the above apparatus will compare favourably with the production of the electric light from a dynamo-electric machine for the photographer, and when we consider that the cost of the whole of the above apparatus, consisting of a generator, automatic lamp, reflector, and all the necessary appendages, is less then one-tenth of the dynamo machine, motor, shafting, &c., to produce the same result, it would seem to have a greater claim for its adoption with those who wish to employ the electric light, whether for work at night, use in the sitting-room, or to assist daylight on the dark and foggy days of winter.

Fig. 2 shows the arrangement of the electric lamp. A is the automatic regulator, B the reflector, C top extension of the reflector, D small tissue paper screen to prevent the intense arc-rays from coming in contact with the sitter, E stand with sliding rod. This appendage can be wheeled about with ease, as it is arranged to run upon four castors.

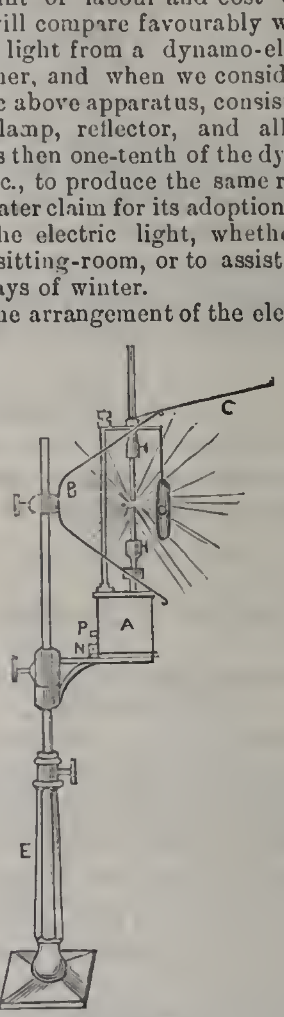


Fig. 2.

When the generator is in use it may be placed within easy reach of the operator, so that the exposure may be made by lowering the elements in their troughs just for the requisite time, and withdrawing immediately the exposure is made; there is no need to fear any inconvenience from deleterious fumes, as none are given off, so it may be used in any studio or sitting-room without any inconvenience from this source, and as far as many trials have gone, it seems to meet every requirement demanded by the photograper for the production of portraits by means of the electric light.

◆

FRENCH CORRESPONDENCE.

Camera for Balloon Purposes—Photo-Reliefs by M. Guimaraes—Photography by the Electric Light, and the Selenium Photometer—New Transfer Method for Heliotypes—Honour Conferred on M. Franck de Villecholles—Lecture on Photography before the Marseilles Section of the French Alpine Club.

Immediately on my return to Paris, after the vacation, I hastened to pay my promised visit to the Electrical Exhibition, and the first objects that I looked for there were those which had any relation with the photographic art. Although, as might be expected, the number of these objects is small, still there are some applications of electricity to photography of very great interest.

Camera for Balloon Purposes.—Let me mention, in the first place, the automatic camera for use in a captive balloon, exhibited by Mr. Woodbury. This instrument consists of an oblong, rectangular box, containing a circular shutter placed behind the lens, and a square block mounted on a central axis, and carrying sensitive plates on its four sides. To this box are attached, by means of binding screws, two electric wires, one of which serves to rotate the plate-holder, and the other to move the instantaneous shutter. The box is suspended from a captive balloon, and the operation of taking the photograph only commences when the balloon has arrived at the proper height, and is in the right position for taking the view. By the arrangement above described, four photographs can be taken consecutively before the balloon is brought down again, and then the plates which have been exposed can be removed and replaced by others. Without entering into more detailed explanation, it will be readily understood to what excellent purpose such an instrument might be turned in actual warfare. I can only hope that the ingenious arrangement devised by Mr. Woodbury, now some five years ago, will attract the attention of our military and naval authorities, and that henceforth every expedition will be equipped with a special photographic apparatus, which can be used, not only for topographic purposes, but also for taking instantaneous views with the aid of a captive balloon. The imagination can readily realise all the benefits which such an apparatus would have produced in the late siege of Paris by the Germans. The great difficulty to overcome is the relatively feeble sensitiveness of the plates, for they cannot be made too sensitive, in order that the exposure may be the shortest possible. A balloon when raised in the air is in constant motion, not only in the direction of the current which impinges on it, but also by turning on its own axis, sometimes in a direction from left to right, and then again from right to left. At the exact moment when the direction of the motion of revolution is about to change, there will be a dead point, which the operator can observe with accuracy by means of a good telescope. At this moment he must release the shutter by means of the electric wire which communicates with it. This balloon-camera of Mr. Woodbury is one of the most interesting applications of electricity to photography.

Photo-reliefs by M. Guimaraes.—MM. Otto A. Moses and F. G. Guimaraes exhibit specimens of photographs in relief on paper, and of bas-reliefs and intaglios in bronze, silver, and platinum. I have had an opportunity of seeing the original plane photographs by the side of the intaglios which are the result of the process. These intaglios are very deeply cut, and I have no idea how they are produced. I can only relate what I have been told, that they are obtained by making the light act through a negative on a sensitive substance similar to bichromated gelatine. By washing, all the parts not acted on by light are removed, and the depressions which are thus produced are transformed into relief in metal by moulding and electro-plating. An intaglio of this kind can be produced (according to the exhibitors) in about twenty minutes. If this be true, the method is one of very great interest, and I am very glad to see the photographic art enriched with a new process of so much promise, which probably can be adapted with considerable success to many industrial purposes, and which will be of great service in decorative art. I shall not fail to follow the progress of this remarkable invention.

Photography by the Electric Light, and the Selenium Photometer.—The exhibition by M. Lièbert of photography by the electric light, on the Vander Weyde system, attracts a great deal of attention; portraits being taken every evening. M. Lièbert has kindly completed his arrangements by the addition to his working apparatus of my selenium photometer. By means of this instrument, so sensitive to all the variations of light, whether from an artificial or a natural source, he can regulate the intensity of his illumination so as to make it always constant, and at the same time to observe the differences which occur in the illumination, according as the light is required for intensity or for quantity. I propose to take advantage of this opportunity to complete my studies on this photometer, and on the conditions of its use with artificial illumination —and especially of the electric light—the employment of which promises soon to become as common as that of lighting by gas.

New Transfer Methods for Heliotypes.—As I have had occasion to speak of M. Lièbert, it may be interesting to say a few words about a new system of transfer which he has shown me, and the application of which on a large scale would effect a revolution in the reproduction of drawings and engravings, either with the aid of photography, or else without it in certain particular cases, which I proceed to indicate. Let me first explain the principle on which this wonderful transfer process is founded. An engraving or a typographic print, of which the image or lines are rendered in fatty ink, is immersed in a liquid whose composition is as yet unknown. After having passed through this bath, the sheets may be applied to a lithographic stone, or to a zinc plate; they are then passed through the press, and the image is completely transferred, the original having lost none of its colouring matter, nor of its delicacy. In short, the original remains in the same condition as it was before the operations. The liquid of which I have spoken must have the property of coating with some fatty substance all the parts of the paper already inked, but must be unable to penetrate in the slightest degree into the pores of the paper not protected by the body of the fatty ink. There must be, in fact, a sort of affinity of the fatty substance forming the image for the liquid, without in any way affecting all the parts of the paper which remain white. If all these points are as perfect as M. Lièbert declares them to be, which I cannot well disbelieve, this process constitutes a most important invention, and will effect considerable improvement and economy in the processes of transforming engravings, drawings, and photographs into lithographs or typographic plates. This invention, to which the name *Isographic* has been applied, is due to M. Magne, and the working management has been confided to M. Lièbert. I hope that very soon workshops specially arranged for carrying on this transfer process will give an opportunity to anyone who may wish it, to have copies taken by this means, from which from transfer to stone or zinc any number of prints may be drawn. Photographic prints in fatty ink, such as heliotypes, can by this means be easily transformed into typographic plates.

Honour Conferred on M. Franck de Villecholles.—I have just learnt with great satisfaction that one of the principal of our Paris photographers—M. Franck de Villecholles—has received the palm leaves of a member of the Academie, and this is in appreciation of his twenty years' service as a professor of photography at the Central School of Arts and Manufactures. So great a national honour could not well be better deserved.

Lecture on Photography at the Meeting of the Marseilles Section of the French Alpine Club.—Before leaving Marseilles to return to Paris, I had the honour of reading a paper before the French Alpine Club, on photography for tourists. For mountaineers this subject was a most interesting one. Climbing rocks is not the whole business of the Alpine clubist. He ought to be able to bring back from his excursions as complete recollections as possible. His diary, his written notes, his sketches—all assist in recalling to mind the interesting scenes which he has traversed; but how much more accurately and vividly this could be effected with the aid of photography! This cannot be gainsaid. Tourists only want a sufficient acquaintance with a method easy of being put into operation in travelling, and, secondly, to be provided with apparatus sufficiently portable. The former of these points I thoroughly elucidated in my lecture; the latter I illustrated by showing how portable apparatus should be constructed. I endeavoured to prove how photographers can meet this great want, and how they are able to supply our tourists with a simple and portable means of taking photographic views on their journeys.

Leon Vidal.

A SHORT TOUR IN NORTH WALES.

BY DR. MORTON.*

For an individual in good health and spirits, with the faculty to appreciate the beauties of nature and art, it is an excellent and interesting subject to him, or her, as the case may be, to plan and carry out a summer holiday excursion; but to give an account or write a description of one's doings for a fortnight is rather another thing. However, something of general interest may be said, and this is my only excuse for giving a few notes on a short tour in North Wales this summer.

Owing to limited experience of this delightful district, and the fact that out of sixteen days, or seven, at least, rain and wind prevailed, it could not be expected that the photographic results would be either numerous or highly satisfactory. Yet, under favourable circumstances, I cannot conceive of a more agreeable or suitable locality in which to take a camera than North Wales. Our friends of brush and pencil have long recognised the unique natural beauty abounding there, and most of us are familiar by report, if not by actual observation, of many delightful spots. Thanks to good railway facilities, it is a very easy matter to be taken direct to the scene of action. On Friday, August 19, tourist tickets (two monthly at 19s.) were procured for Carnarvon, via M. S. and L., and L. and N. W., which gives the privilege of stopping at Chester and all stations west of Rhyl, either going or returning. The first step was to take an ordinary train to Manchester, thence by L. and N. W. (adjoining platform) through Stockport to Crewe, thence to Chester. We (for in addition to my friend the camera, as Mr. Hasley remarks, Mrs. Morton accompanied me; and I might here observe that a helpmeet is really a help on these excursions, if it were only a tripod) stayed at Chester, of ancient renown, Saturday and Sunday. A few plates may be well employed on this historic city—such subjects as the Cathedral) which, by the way, is still undergoing restoration), interior of St. John's Church, Phœnix Tower on the City walls, numerous old timbered houses (which I was sorry to see more modernized than of yore), good distant views from the city walls, which perfectly encircle the city, for those who like long shots. I noticed, photographically, that the Cathedral, from its confined position, requires a wide-angle lens; an ordinary rapid rectilinear will not do. The building, being of dark red sandstone, needs rather long exposure. A good general view may be taken of the south-east front from the wall early in the morning—other aspects later in the day are limited by surrounding houses. The Castle, with river at the base, a not very inviting subject, is best in the afternoon. Leaving Chester on Monday by train for Llandudno Junction, passing Flint, where there is a fragment of ruined castle almost pushed over by some chemical works, Holywell, Bagul, and Rhyl (some people stop here, but for what I am at loss to say), passing the stations of Llandulas, Abergele, and Colwyn, we reach Llandudno or Conway Junction—or, for brevity, the Junction—only a mile or less from the station and town of Conway. Having plenty of time, we left our luggage at the Junction and proceeded to Conway Castle, a grand old pile, built by Edward I. in 1284. It makes an imposing picture, but the suspension and tubular railway bridges which run side by side destroy, in my opinion, the artistic effect. Prior to 1822, when the bridge was commenced, a more picturesque bit could not be imagined.

The view from the river or estuary is best at rather low water, if you want to include the bridges, and the time is morning to mid-day. Another aspect from the town side is fine, but requires a short focus lens, and afternoon sun. An old mansion, the Plas Mawr, needs same treatment. Ruined walls are abundant, but present only the simple architecture of the period, narrow slits for windows.

The interior of the castle is very dilapidated, and, moreover, has an "ancient and fish like smell," as Shakespeare has it. The sanitary aspects of the town generally might be improved. Returning to the junction, we take a train to Bettwys-y-Coed, and, as suggested in the guide-book, occupy a seat on the right-hand side of the carriage, so that a view of the Conway can be noticed. At first the scenery is a trifle tame, but soon you meet with characteristics of Wales. Mountains gradually hem you in, until Llanrwst and Bettwys-y-Coed station is reached, and here those who enter for the first time are struck by the natural beauty of the situation, surrounded by verdure-clad mountains. The village street or road lies to your right, southwards. Houses, mostly modern, but elegantly built of slate, relieved by climbing plants, tumbling streams from the hills towards the silvery Conway, which meanders through the valley. "Where to go with the camera" is almost answered, for pictures are seen at every step. But personal comfort must be considered before esthetics. A few enquiries will lead you either to a good hotel, of which there are several, or you may get rooms at 25s. or 30s. per week. A nice locality is on the Llanrwst-road, over Pont-y-Pair. Here we stayed a week. As the weather precluded photography, a tour of inspection, which I presume is the next best thing, was made. The notable places which the tourist is advised to visit are numerous, but I can only mention those which time permitted me to see. There is a little thing I ought to have taken with me, but did not, viz., a pocket compass—a useful assistant in taking bearings, and necessary in recording position and sun effects correctly, the time of year of course being considered. My impression is, that August is too late for Wales, both as regards lighting and mist. The pictures I tried in this neighbourhood were unequal, partly due to the inclement weather, and uncertainty as to the requisite exposure of a certain batch of plates. Starting close at home, Pont-y-Pair Bridge requires a wide angle lens for a complete picture, if taken from the bridge, and is well lighted till afternoon. A view below the bridge from the bed of the river opposite Royal Oak Hotel is also good—time 10 to 1 p.m.—and needs a comparatively long exposure, as the river near the bridge is in deep shadow. Sunlight is not desirable, but a good diffused light, as the stones on most of the streams are very white, and tend to chalkiness in the picture. Crossing the bridge and turning to the right we get on the Bangor road, south-west direction. The Miner's Bridge, a rustic wooden structure a short distance from the main road, well deserves a plate, either up or down stream. Two miles further we reach the famed Swallow Falls, a rather difficult subject, but a splendid sight when there is plenty of water. The photographs I have seen do not do it justice, looking more like skeins of white wool shaken out, than the real thing.

Southwards from Bettwys, in the direction of Penmachno, crossing the Conway over Waterloo Bridge, we soon reach two roads, the lower leading to the Fairies' Glen, the Vale of Lledr, or Dolwyddlan, and Beaver Bridge. The upper is the main road to Conway Falls and Pandy Mills. First we made a visit to the Fairies' Glen, the most entrancing spot in this locality. The river, a tumbling torrent, forcing its way through a deep gorge with overhanging trees and ferns, makes a sharp curve to the right; as you stand looking up at this point, a splendid picture ought to be obtained, weather permitting, and worthy of the largest plate ever made. I should say early in the morning in June would be the time, and you would miss the influx of visitors, who are apt to interpose their corporeal structures most inartistically. The road leading to Conway Falls affords some good distant views; one in particular, with Moel Shubod in the distance, has been considered the finest view in North Wales. Afternoon is most suitable. Good general views of Bettws and Vale of Conway are readily had by climbing a high hill. On the top is a farm house, and beyond a large lake. The river Conway and streams Llugwy and Lledr afford endless pleasing stereoscopic pictures, but I found the wind too boisterous. Returning again to the junction, we took the train to Llandudno, four miles distant. This well-known resort is pleasantly situated on a fine bay, having the little Orme's Head to the north, and the Great Orme's Head, with its fine marine drive of five miles and a-half, to the south-west. The lesser head affords a fine study of rocks, and is well lighted about 4 p. m. The Great Orme's and Happy Valley, a fine recreation ground, makes a stirring picture in the forenoon; a good general view can be had on a clear day from this locality of Conway Bay and Welsh mountains. I made a visit out of curiosity to St. Dudno's Church, which is on the summit of the Head, and secured a view. Leaving Llandudno after a few days' rest, we proceeded via the Junction and Conway to Bangor, and unless you are going to Ponryn Castle it is scarcely worth staying at, so get off at the Bridge Station for Menai Suspension Bridge. A good view can be had by crossing over to the Anglesea side, at low tide, and about noon there are several other points; also at Beaumaris; but time was short, so we walked up to the Tubular Bridge, two miles and a-half distant. There is a station on the Carnarvon line called Treborthn; if you can catch the train, it is very convenient, as you are only two fields off; here the Holyhead line diverges from the Carnarvon line, and a fair general view of this interesting structure is to be had from a field on the Carnarvon side to the left hand. Continuing our journey to Carnarvon, being late, we stayed the night, and, on reconoitring, the famous Castle is found to have a long frontage south-west to the river and slate wharf. A western end, at which stands the Eagle Tower, faces the sea, and the drawbridge, or Queen Elinor's Gate (no entrance from this end) to the east, consequently the best general view is from across the ferry, morning and evening preferable, as the walls show rather flat, in spite of the various fishing boats and slate barges about. Entering the Castle by the North tower, a splendid Gothic gateway should be particularly noticed. The interior views are interesting, but the walk through the stone-roofed apartments and corridors are simply enchanting, forming altogether a noble ruin, and doubtless the finest example of 13th century work extant in this country. I should certainly advise the tourist to visit Llanberis, Snowdon, Beddgelert, Festiniog, &c., before leaving the locality.

---

* Read before the Sheffield Photographic Society.

Correspondence.

THE HANGING OF EXHIBITS.

Sir,—Complaints are frequently made at the mode in which the exhibits in the Photographic Exhibition are hung; and, consequently, I was very glad to notice your stricture on this point in last week's News. And first, I have been assured that there is no hanging committee at all; or, if there is one nominally, that the arrangements are practically in the hands of the assistant secretary and the attendants. Whether this is the case or not I know not, although it may account for a great deal. In the present exhibition, pictures which are devoid of taste, or beauty, or interest are well placed, notably two which are both placed on the line, one being extremely inelegant, and the other absolutely vulgar; while others which do possess some, and others which possess all, of these qualities are badly hung. Moreover, pictures after being hung have been moved to better places—one, a hideous one, even after the day of opening; while to similar, and certainly more justifiable requests with regard to others, no attention has been paid. Again, while the rule as to sending the exhibits in by a certain day is kept by the great majority, it is set at naught by others, whose exhibits, in consequence, are sometimes better hung than they would be otherwise. As for the catalogue, the number of omissions and mistakes are regrettable, and too often cause annoyance to visitors, and sometimes, in addition, loss to the exhibitors.—Yours truly, A. L.

CARBON PRINTING.

Dear Sir,—Permit me to correct an error in the report of the South London Photographic Society's meeting, which appeared in your last number.

In the discussion on Mr. Wilkinson's paper, I am made to say "that if the tissue was not in very good working order, the collodion substratum was the best." What I said was, that if the tissue was not in good working order, a *chromated gelatine* was the best. J. W. Foxlee.

Proceedings of Societies.

Sheffield Photographic Society.

The annual meeting of this Society was held on Tuesday evening, Oct. 11th, at the Freemason's Hall, J. H. Morton, M.D., presiding. There was a good attendance of members.

The minutes of last meeting were read and confirmed, the financial statement (which had been audited by Messrs. Hadfield and Yeomans) was then presented, and a balance was declared to be in the hands of the Treasurer, and it was agreed to reserve it for future contingencies.

After a cordial vote of thanks had been awarded for past services, the election of officers for the ensuing year took place as follows:—

President—Dr. Morton.

Vice-presidents—Messrs. J. D. Leader, F.S.A., and W. Dakin.

Treasurer—Mr. J. Stringfellow.

Hon. Secretary—Mr. J. Taylor.

Council—Messrs. J. H. Rawson and G. V. Yates.

Councillor T. Firth proposed, and Mr. H. P. Collinson seconded, that the arrangements for proposed exhibition of pictures and lantern entertainment in January be carried out by the Council of the Society, with power to add to their number. Agreed *nem con.*

Mr. J. Stringfellow exhibited a handy zinc washing trough, made by Geo. Houghton and Son, London.

The Secretary announced that Mr. J. Traill Taylor had sent copies of the *Photographic Times* to the Society; and it was resolved that they be acknowledged with thanks.

The President read a paper, entitled "A Short Tour in North Wales" (see page 502), illustrated by prints from negatives taken by him of the places visited.

A hearty vote of thanks was accorded to Dr. Morton for his interesting contribution.

The members had a substantial tea provided for them by the steward of the Hall, and a pleasant evening was spent.

Photographers' Benevolent Association.

At the October meeting of the Board of Management, the minutes of the previous meeting were read and confirmed; Mr. John Moyer was elected an ordinary member of the Association, and it was decided that the Photographic Society having kindly granted their exhibition at Pall Mall to the Photographers' Benevolent Association for an evening in aid of the funds, Friday, Nov. 11th, would be the most suitable date. On that occasion the Gallery will be open from 7 till 10 p.m., the charge for admission being 6d. The hope was expressed that all members would use their utmost efforts to ensure success.

Photographic Society of Ireland.

The opening meeting of the season was held on Friday, the 14th inst., in the Royal College of Science, Dublin, Mr. J. E. Madden in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. M. Glover was elected a member of the Society.

Mr. J. V. Robinson read a paper on "The Newest Forms of Photographic Apparatus," and exhibited a variety of apparatus, including Mr. George Smith's new camera, also one by Jonté, of Paris, which was much admired for several improvements, not usually met with in the cameras by English makers. He also exhibited a collection of instantaneous shutters by Messrs. Cadett, Chadwick, and Hunter and Sands.

The several advantages and disadvantages of the different instruments were fully criticised in the discussion following.

Prints from the majority of the negatives taken at the recent excursion of the Society were then exhibited, also a large collection of work, including some excellent examples of instantaneous photography, all by members of the Society.

The meeting then adjourned to the 11th of Nov., when the annual meeting takes place.

Thursday Evenings for Photographers.

At the meeting held on the 13th inst. the chair was occupied by Mr. W. H. Le Fevre.

Mr. Cowan exhibited and explained an apparatus for cutting up plates in the dark, which he had designed, and which is being sold by Messrs. Marion and Co. It consists of a cutting-board, to which is attached a folding frame resembling a parallel ruler, in which the plate to be cut is placed, and upon the frame being closed, the centre of the plate is brought under a straightedge, and can be cut exactly in half, a whole plate making two half-plates, a half-plate, two quarters, &c., one great advantage being that the only contact with the film is where the straightedge rests. He also showed the front of a copying apparatus to which he had fitted an attachment on the same principle, for holding the negative to be copied.

The question of the advisability, or otherwise, of making emulsions rich in bromide, and the best means to attain that end, was then discussed.

Mr. Henderson suggested that as only a certain quantity of nitrate can be mixed with gelatine without destroying its setting powers, the desired result might be obtained by making an emulsion with another body instead of gelatine; and in answer to Mr. Cobb as to the advantage to be gained by using an emulsion rich in bromide, Mr. Henderson said he thought greater density, and less liability to frill, would be the result.

Mr. Cobb said he did not find any advantage in using an emulsion rich in bromide.

Mr. Brown had found that there was less liability to frill if only a small quantity of gelatine was used.

Mr. Conn said he found that the most sensitive films were those which had a matt surface, and also that when in that condition there was not so much halation is when the film was polished.

In the course of a short discussion on "Balloon Photography," Mr. Debenham said that at a recent meeting it had been stated that if the forward movement of a balloon could not be stopped, the gyration, which is much slower, might be overlooked. He (Mr. Debenham) did not think that such was the case, but, on the contrary, that the displacement of the image by the gyration would be found to be much in excess of that caused by the forward movement of the balloon.

Some excellent instantaneous negatives of Hastings were exhibited by Mr. Reimann.

Manchester Photographic Society.

The annual meeting took place on Thursday evening, the 13th inst. Mr. A. Brothers, F.R.A.S., in the chair.

The minutes of the previous meeting were read and confirmed, after which the following gentlemen were elected members. Messrs. H. Storey, W. A. Carr, Openshaw, Butterworth, G. Wood, A. Whitham, and J. W. Hawksworth.

The Hon. Secretary (Mr. W. J. Chadwick), then read the annual report, printed copies of the Treasurer's balance sheet being already in the hands of the members. After satisfactory explanations had been given to various inquiries,

Mr. R. Atherton proposed the acceptance of the report and balance sheet; and made a few remarks upon the energy and perseverance that had been displayed by the Hon. Secretary, to whose exertions was principally due the credit of the satisfactory financial position of the Society. He proposed a special vote of thanks to the Hon Secretary, which was carried with acclamation, and acknowledged by Mr. Chadwick.

The Chairman then introduced the subject of a proposed soirée, and it was resolved "That a soirée and photographic exhibition be held as soon as convenient."

A new code of rules which had been proposed and revised by a committee in due form, was unanimously accepted, and a printed copy will be forwarded to each member.

The following officers were elected for next year:—

President—E. Leader Williams, M.I.C.E.

Vice-Presidents—Rev. Canon Beechy, M.A.; A. Brothers, F.R.A.S.; J. Chadwick; A. Coventry, and J. W. Leigh.

Council—R. Atherton, W. Blakeley, T. Chilton, J. T. Chapman, S. D. McKellan, J. Pollitt, J. Schofield, J. Warburton N. Wright, and J. Young. *Hon. Treasurer*—W. G. Coote., *Hon. Secretary*—W. J. Chadwick.

A hearty vote of thanks was tendered to Mr. A. Brothers (the late President) for his very diligent services, and also to the other retiring officers; to which Mr. Brothers responded.

Mr. S. Chilton exhibited a number of high-class negatives taken on gelatino-bromide plates, and gave the benefit of further experiences in the process, which was followed by interesting remarks from other members.

The Chairman exhibited a print from a wet collodion plate, in which "oyster shell" markings were predominant, and said that they had been caused by using a new carrier in the dark slide on the occasion of a very long exposure in the camera.

Messrs. J. W. Leigh, E. Leader Williams, J. C. Hattersley, and other gentlemen had come with a number of photographs and other matter of interest connected with photography, but owing to the lateness of the hour, the meeting was adjourned.

Talk in the Studio.

Photographic Society of Great Britain.—The first Technical Meeting of this Society for the ensuing session will be held in the Gallery (Exhibition), 5, Pall Mall East, on Tuesday next, October 25th. The chair will be taken at 7·30 p.m.

A Photometric Balance.—The rapid development of the electric light increases the importance of having a simple and exact means of measuring light intensity. An instrument claiming to meet this want has been invented by M. Coulon, who calls it an *athermanous* photometer, as being acted on only by luminous rays. Its principle is that a radiometer, whose temperature is constant, turns solely under the influence of light (and this M. Coulon establishes by experiments). The apparatus consists of a radiometer bulb fixed in the middle of a cube-shaped metallic case, having four lateral apertures, closed with glass, through two of which light can be sent horizontally, traversing the bulb, while the two others allow of observing the bulb. This case is filled with water, which, through four vertical tubes, screened from the bulb, and surmounting spirit-lamps, is heated to a temperature above that of the radiant heat of the sources to be measured (in practice about 100° suffices). As to the bulb, it contains, *in vacuo*, a disc movable round a vertical axis, the half disc on one side of this axis being black on its two faces, the other white. Suppose now a single source of light to act on the bulb from one side, it attracts the white half and repels the black, so that the disc turns edgewise to the light, and presents one side to the observer. If another equal light acts simultaneously on the other side, and at the same distance as the first, the counter action results in the disc presenting its sides to the light, its edge to the observer. Where unequal lights are compared, one may always, by shifting one of them, bring the disc into the second position just specified, and by then measuring the distances, ascertain the ratio of the intensities. Another plan, which obviates shifting the lights, consists in the use of a number of graduated diaphragms to act as screens. M. Coulon's apparatus (which is described in *La Lumiere Electrique*) is not patented, and can be made at little expense.—*The Times.*

To Correspondents.

⁂ Electric Lighting.—Press of matter compels us to postpone our second article on the subject.

⁂ A cheque for two guineas will be paid for the best practical article on "Photographic Residues and Waste; What is worth saving, and how I save it." The name of the author need not appear. For rules, see previous numbers of News. Contributions must reach this Office by the 1st November.

W. H. M.—Such a film is extremely brittle, and is liable to crack into a multitude of separate pieces or panes; but the additions you mention give a certain amount of softness and extensibility. It is requisite to strike a mean between extreme friability on the one hand, and that softness which may cause the print to adhere, on the other hand.

G. M. Redaway.—Any one of those firms which undertake the making of enlargements will do what you require, and you should therefore consult our advertising columns. As we cannot recommend any one firm specially, the letter has been returned, so that you can use your own judgment.

Photometrician.—The fact of No. 5 constantly appearing before No. 4, certainly indicates a defect in the instrument.

W. A. Whiston.—Mr. Duncan C. Dallas, of Hatton Garden, London, will probably undertake the work in either one of the forms you mention.

J. B.—A small proportion of "liver of sulphur" or impure sulphide of potassium will throw down the whole of the silver as a black precipitate of silver sulphide.

Calx.—Not under any circumstances.

Exporter.—Good corks well put in and secured are more satisfactory than stoppers for ether or collodion, and, considering the rough district through which the goods will have to pass, you had better use soda water bottles.

Pyroxyline.—The crystals of potassium nitrate are anhydrous; that is to say, they contain no water of crystallization; but it frequently happens that traces of water are held mechanically in the interstices. Either powder and dry in a water oven, or carefully fuse.

Fearful.—It has been patented not less than six times, and as the first patent has long since expired, you may banish your fears.

A Beginner.—Photographers are not nearly so particular in referring to this matter as they were ten years ago; still we would recommend you to follow the surer, although somewhat slower course.

Andrew Todd.—Something of the kind was proposed about ten years ago, but it was not brought to a practical issue.

Alexander Gordon.—1. As a makeshift it will doubtless serve fairly well; but considering that the usual and more convenient article is easy to obtain and as cheap as the substitute, it is difficult to see where the advantage lies. 2. A saturated solution of chloride of sodium will be quite sufficient. 3. Rub the glass well with French chalk before collodionizing.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1208.—*October* 2 , 1881.

CONTENTS.

PAGE
Electric Light in the Studio ... 505
Practical Experiences ... 506
The Photographic Exhibition ... 506
Dangers of Pyrogallic Acid. By Dr. T. L. Phipson ... 508
A Photographic Holiday ... 508
Notes ... 510
Topics of the Day.—Cheap and Effectively Finished Enlargements. By George Croughton ... 511
South London Photographic Society ... 512

PAGE
Method of Mixing Gelatine Emulsions. By Captain W. de W. Abney, R.E., F.R.S. ... 512
On the Quantity of Silver Used up in Different Photographic Processes. By Dr. J. M. Eder ... 513
A Paris Studio ... 514
Correspondence ... 515
Proceedings of Societies ... 515
Talk in the Studio ... 516
To Correspondents ... 516

ELECTRIC LIGHT IN THE STUDIO.

Second Article.

Having in a recent number given some particulars regarding the arc light, and more especially discussed the arrangements introduced by Mr. Jarman,* we now propose to describe some experiments we have made with the incandescent lamp recently introduced by Mr. Swan, these experiments showing that the lamp in question is well suited for most of the purposes of the photographer.

Our readers know that Swan's lamp consists of a thin carbon thread enclosed in an exhausted glass bulb, this thread being included in the battery circuit by means of a pair of platinum conducting wires passing through the glass. When a sufficiently powerful current is passed through the carbon thread it becomes intensely hot, and emits a brilliant light, but the carbon cannot burn away, because all traces of air have been removed from the bulb.

We first tried the Swan's lamp with the current yielded by a small hand Gramme machine, this being supposed to yield a current equal to about fifteen Bunsen's cells; but the result was not altogether satisfactory, as the carbon thread was only heated to low whiteness, and the emitted light was by no means rich in the actinic rays. The next experiment was made with ten Grove's elements arranged in series; and about the same result was obtained as when the Gramme machine was used; but on increasing the number of cells, the light gained rapidly in brilliancy and actinic power. A halt was made at thirty cells, as the appearance of the lamp at this stage and some preliminary trials with sensitive paper promised a satisfactory result. A half-length portrait was taken by the light of the Swan lamp at this stage, the dark-room being fitted up as a temporary studio for the occasion. Behind the sitter was placed a rather dark background, while the lamp was set about four feet from the sitter, and nearly level with his chin. Care was taken to place the lamp so much on one side as to cause its image to fall on the extreme edge of the plate; but before the exposure was made, those rays which streamed towards the lens were turned back on the sitter by means of an improvised reflector, which consisted of a metal scale-pan highly polished on the inside. A large sheet of white paper was so placed on the side opposite the light as to catch and reflect as much light as possible, while an assistant held a mirror at a point near the sitter's knees, and kept this reflector in motion so as to soften the extremes of light and shade on the face. A pair of 1B portrait lenses was used, and a double carte plate; one half receiving an exposure of thirty seconds, and the other fifty seconds. Both pictures were well-exposed, full details being visible in the deep shadows; and the experiment may be considered to have incontestably proved the value of the Swan light for portraiture.

In order to judge of the possibility of working with less battery power, we reduced the number of cells to twenty, but the result was unsatisfactory in the extreme. The light, as estimated by the eye, was certainly much reduced, but the diminution in actinic power was disproportionately greater; exposures equal to those previously given serving only to impress the merest trace of the highest lights.

This experiment conclusively proved the necessity of employing ample battery power with the Swan's lamps, and our further experiments were therefore made with the full series of thirty cells.

The lamp was next adjusted in an optical lantern, and an enlarged image of a transparency projected on a screen; the result being highly satisfactory, both as regards the colour, which was clear white like the lime light, and as regards the intensity of the illumination. A small key provided with a cross handle like that of a stopcock served to instantly make or break contact with the battery, immediately extinguishing the light, or calling it into full activity; and we could not help being struck with the numerous other advantages which the Swan light may offer to the lantern exhibitor. All the trouble incident to the preparation of oxygen is avoided, together with the bulky gas bags, and risk of explosion; while the fact of no combustion taking place in the lantern renders it practicable to prevent the escape of every ray which does not pass through the condenser and render good service.

Our next experiment was a trial of the light for enlarging purposes, and with this view we adjusted the apparatus so that the enlarged image on the screen corresponded to an amplification of fourteen diameters. Under these circumstances an exposure of thirty seconds served to give a fully-exposed negative; indeed, it was rather over-exposed than otherwise, and would, in all probability, have been equally good if one-third less exposure had been given. A portrait combination was used in making the enlargement.

The battery which we used, that invented by Mr. Justice Grove, is certainly one of the best as far as energy of current and constancy are concerned; but, as pointed out in our article of last week, it is subject to certain disadvantages, and we are inclined to think that it might well be replaced by some other form in which acid fumes and porous cells are avoided. It is extremely probable that the set of forty-eight large bichromate cells, as described by Mr. Jarman in our last issue, would serve to maintain in action several Swan lamps arranged in circuit. In such a case it would be of considerable advantage to the photographer to be able to use either the arc light or of Swan lamps at discretion; while by somewhat increasing the battery power, it might be practicable to employ both systems in conjunction. This would doubtless be of great advantage in obtaining certain artistic effects of lighting. It may be safely assumed that by the use of three Swan lamps, two on one side, and the third on the other side, it would be practicable to reduce the exposure to ten seconds.

---

* See page 500 of last week's issue.

PRACTICAL EXPERIENCES.

Not to regret the past, but to be wiser for the future, is an old proverb, which, at critical moments in our lives, is apt to intrude itself with indescribable force. To the novice who, armed with a complete equipment, starts on his first photographic holiday, there will occur many things to regret, and it is to assist him in being wiser for the future that we propose to offer a few remarks on the subject of experiences. There is nothing like a fortnight's hard work with a camera out of doors to teach one the defects of one's apparatus, and the numerous little dodges and labour-saving appliances which a summer's experience suggests; thus affording endless amusement during the winter time in preparing for the following year's holiday. Among the impedimenta usually considered necessary for a photographer's outfit is a leather case for holding the camera, lenses, slides, &c. Now, a leather case is a very useful article, and no doubt protects a camera better than any other material; but, on the other hand, it is heavy, expensive, and looks uncommonly like a pedlar's pack, or a traveller's case of samples. On the other hand, a bag made of the brown canvas used for leggings, and bound with leather, forms a very efficient substitute. In India this material is largely used for coats, and sportsmen clothed in such can defy the thickest jungles. Another useful material is the grey waterproof holland used for knapsacks; and as this material is usually employed by artists to carry their sketching kit, it is less conspicuous. Partitions can be made in the bag to separate the camera from the slides, and the lenses can be carried in a small compartment at one end, and the tripod at the other. The brass triangles supplied with folding stands are convenient and strong, but they have an objectionable way of scratching the underside of the camera, and not only remove the polish, but leave deep marks into the bargain. It has been suggested—we forget when and where—to stretch small india-rubber rings over the points of the tripod, and so protect the base of the camera, and obtain by the cushioning of the india-rubber a firmer hold of the camera. At first sight this appears an improvement, and we tried it for some time; but we found a corresponding disadvantage in the fact that if the rubbers were thick enough to really lift the camera off the tripod, it frequently happened, in turning the camera round to follow a view, that one of the rings came into the panel of the base-board, and the camera remained supported by two instead of three points. We have found a safe dodge to be to use a piece of card covered with velvet or felt, and attached to the tripod by three small pieces of binding wire. The wire is passed round the card and frame of the tripod, and the felt is glued over the card. A small hole is then made in the centre for the screw to work through. Talking of screws, we know one gentleman who invariably carries two or three in his trowsers pockets. We have done the same, to find that, when setting up our camera with itching fingers, the screw was reposing at home unconscious of our sore need. We now tie our screw on to the underside of the tripod, and defy such experiences. If the string be attached to a small piece of brass wire, clamped loosely in the form of a ring round the hollow between the shoulder of the screw and the head, the camera can be screwed up without the string coiling up or becoming untied, as it often does if attached simply to the head of the screw. A friend of ours who worked for many years in the Cape, and produced some of the finest photographs of that country ever exhibited, had many of these dodges. The cap of his lens was chained to the front of the camera. A small ring was screwed through the centre of the cap, turned over a little washer on the inside, and attached by a penny brass chain and a swivel hook to the front of the camera. "I once lost the cap of my lens while away on a week's tour," said our friend, "and I attached this on my return." It is only experience that teaches such dodges as this, and we can heartily recommend it.

Dark slides, too, are only dark when in a case, and unless the shutters are made about half an inch thick, it cannot be expected that they should be thoroughly light-tight if exposed to a strong sunlight. The slides should each fit loosely in a bag made of grey or black waterproof material; the top should lap over and button, and the number of the slide be printed in large figures on the front and back of the bag. If care be taken always to expose in numerical rotation, the bag can be at once selected containing the required slide, and no fumbling nor mistakes need arise.

The care which lenses require suggests itself every day when it is found necessary to wipe the object glasses, and very often to unscrew the combination of a doublet to remove dust from the inside. If the lens has a slit for Waterhouse stops, it is advisable to stretch an india-rubber ring over the mount, and push it over the stop slit after removing the stop. The ring serves also another purpose: it keeps light out of the camera when working with the full aperture of lens. A very appreciable amount of light comes in through the slit, a fact which can be easily verified by examining the inside of the camera with the lens capped.

Stops, too, when loose, are a perpetual snare to the unwary, and a constant source of amusement to the thoughtless. Of course no one should be thoughtless, but to those who are, I recommend to drill a hole through all the stops, and string them on to a key ring, so that while one is being used, the remainder stand by ready for their turn. Of course, if you lose one you lose all; but we must again, with due respect, introduce our Cape friend, who, alive to this possibility, chained them also to the front of the camera. The same ring which held the lens-cap held the stops. There was no hunting about first in one pocket and then in another, to find at last that you had got the stops between your teeth.

We had intended to say something of camera stands and exposure experiences, but must defer it to another time. Our only apology for treating of what may appear to be trivial matters at such length is, that care in the most trivial points is invariably the first step towards success in the more important.

THE PHOTOGRAPHIC EXHIBITION.

[A THIRD VISIT.]

Messrs. James Valentine and Sons, of Dundee, are content to send one frame of pictures (143), but it contains at least two masterpieces: the Gleet Rock, a grand cliff rising out of the dark waves, with its storm-beaten strata depicted with marvellous clearness, is a wonderful picture of desolation, while in contrast to it is a delightful view of Loch Katrine. On the bank is quite a bower of fragile ferns, their soft, delicate foliage enhanced by the vigorous branches of a tree across the picture. Miss Sparks exhibits four tiny views in Scotland (144), all of them soft and harmonious. Messrs. W. F. Morgan and Co. show what can be done in the way of enlargements with their new bromo-argentic paper. Most of the pictures are hung too high for careful inspection; but their tone and finish (see 146, 147) leave nothing to be desired. Mr. W. P. Marsh's Fisher Boy (148) is also a good example of their bromo-argentic enlargements.

Mr. Lydell Sawyer sends two frames of farm pictures, and a study, "Meditation" (280). "Feeding Ducks" takes our fancy most, but several of the groups are good, because they are natural; but we do not like the ovals cut aslant at the four corners of the frames. Mrs. S. G. Payne, one of the few who can photograph flowers, and photograph them well, has several examples of her work on the walls this year; "Grapes" (151) and the frame of roses (223) are the best. Captain Abney, R.E., F.R.S., exhibits a large series of Swiss and home views. The Lyskamm from the Stockhorn (158) is one of the best. The broad top of the snowy giant is traced with much force, while the glacier that sweeps down the side of the mountain has all the softness and roundness that strikes the traveller so vividly who looks upon an Alpine scene for the first time. A symphony in white of this nature is one of the most difficult problems in photography. Mackworth Church, seen through a veil of foliage (277), is also a happy picture.

We do not like Mr. Mendelssohn's pictures so well as last year; or is it that his recent exhibits have led us to expect too much? "Afternoon Tea" (162) is a fine photograph; but there is little tea-drinking going forward. Several of the portraits (336) are very good, one lady arrayed all in white, sitting within a drawing-room screen, making a delightful picture. The use of these screens for backgrounds is a very happy idea, for the portrait strikes one as being taken at home, in a recess in the drawing-room, especially if the lady happens to be in evening dress.

Messrs. E. Day and Son's studies include some charming work. "Thoughtfulness" (179), a sweet face with delicate mouth and softly pencilled hair, is delightful, and so too is the bright childish look in "Grandfather's Watch" (180); in another picture, "Mabel" (165), the big hazel eyes are alone a study. Mr. Arthur Debenham's two portraits represent most excellent work; "Summer" (168) is the better to our thinking, a lady in profile, racket bat in hand, posed with much *aplomb*, the *beau ideal*, or rather the *belle*, of lawn tennis players. Mr. G. Tuohy sends both landscapes and portraits; some of the former are a little marred by the bright skies printed in; but this notwithstanding, the Duke of Connaught's residence, Bagshot (170), is a thoroughly good picture. The portraits taken by artificial light by Mr. Tuohy appear equal to ordinary studio portraits, and this is saying a good deal. Mr. G. E. Alder also shows much good work (243, 298, &c.) taken by artificial light—we presume the Luxograph apparatus—for the most part, ball-room pictures.

Mr. Charles Andrea's contributions are well worth attention. A picture of the High Tor (186); the huge cliff towering aloft above the soft greenery of the still Derwent, pleases us better than any other views we have seen of it; while in another frame (187) there is a grand representation of an old three-decker. Mr. J. Berryman contributes a group picture (189) of the Premier, the Lord Lieutenant of Kent, &c., a good piece of work; Mr. W. Wainwright, jun., shows some woodland views (190) which would have been better for a little lighter printing. The Botanical Studies (192) of Mr. C. H. Evans, being a little too high for proper inspection, include some difficult subjects, which have been most successfully rendered.

The Platinotype Company prove that their process can be successfully applied to portraiture by exhibiting two of Mr. Valentine Blanchard's masterpieces (203, 204), "Esmeralda," and "Helen;" some reproductions of paintings in Platinotype (447, 448) are also very satisfactory. Messrs. Timms and Sons have several portraits and enlargements (205, 485, &c.), and Messrs. Lombardi and Company (206, &c.) send more than one frame of good portraits. Mr. Ernest Soutter contributes a single frame (209) of sketches, of which the best is a snug little boat-house by the riverside. Dr. Huggins has two portraits on the walls (210, 211) printed in plotinotype, and a study of fishing boats (441); the lighting of the portraits is rather monotonous. Mr. Joseph Paget, the donor of the Paget prize, has a frame of frost scenes (212), of which the centre one, the park slope and trees decked with snow, is the best. Mr. J. Laffeaty, the skilful photographer attached to Millbank, sends a forcible collection of convict heads (214), in which the pronounced jaws of the male prisoners are very remarkable. "An Old Churchyard" (215) is contributed by Mr. F. Worsley Benison.

Mr. Andrew Pringle is not so well represented as last year. We prefer his "Isle Pool, Eskdale" (467), with fisherman, which is both printed in silver and platinotype, although the pictures are hung so far apart as to be useless for comparison. This has all the charm of an engraving. Mr. Henry Pointer contributes a large frame of "Brighton Cats and Dogs" (220) which would be of great aid to Harrison Weir and other animal artists for studies of expression. Of Mr. P. H. Fincham's pictures, we prefer "Study of Cattle" (222); the cows standing knee-deep in the stream are depicted with much taste, and we like the brown tone of the print. Mr. Charles Reid's nest of thrushes, and donkey outside a "living carriage" (224), are very good. Illustrations of "Old London" are again furnished by Mr. H. Dixon (227), who has photographed the interior of Ashburnham House very successfully; the same gentleman shows also some copies of oil paintings, which serve to ornament the borders round the ceiling of the room. Of Messrs. Hunter and Sands' pictorial contributions, we prefer the transparencies on the table, which illustrate much excellent work, the most remarkable being the swan lifting itself from the water, of which we have already spoken. Mr. A. Bisset Thom sends some studies from "The Zoo" (237), one or two of which would well bear enlargement. The interiors (323), some of which possess a good deal of character, we like best of Messrs. C. and F. Jones' pictures. Mr. Thomas Chilton has some small "Views" (241), but as they are hung almost out of sight, we could not examine them. As Mr. Chilton sends but one frame, while other contributors are represented by twenty and more on the line, he has some right to feel aggrieved, if his pictures arrived on the day specified for sending in; if they did not, then they should not have been hung at all. Mr. W. M. Crouch sends some portraits (242) before and after retouching.

The Woodbury Company have several magnificent examples of carbon work upon opal, and in the form of enlargements. In the opal work (247) the shadows and tone are perfection, so soft and transparent are the pigments chosen. The enlargements of Miss Vaughan (341) and Miss Violet Cameron (377) are also well worth studying. They are from negatives by Messrs. Downey, of Pimlico, whose charming portraiture, strange to say, is not exhibited by the firm itself, but by the Woodbury Company, the Autotype Company, Messrs. Marion and Co., &c. While speaking of portraiture, by the way, we must not forget to say a word of regret that despite the many fine examples on the walls this year, no medal was given for this branch of the art, or for single studies. It seems really as if it were an oversight of the judges, so strange a condition of things; for figure studies must always remain one of the most important and artistic branches of photography. Herr Heinrich Axtmann, of Plauen, in Saxony, sends a collection of pictures which our British photographers would do well to examine. The smoothness and clearness of his work are faultless, while in some of his composition pictures (in one case entailing the use of fifteen negatives) one hardly knows whether to admire most his indefatigable labour, his patience and perseverance, or his exquisite skill. Look at "Bowlers" (419); the portraits are, perhaps, a trifle set, but so they would be, if it were a picture by a first-class painter. The composition and carrying-out of the picture are wonderful, and the lighting admirable. König Johann's Feier (416), and composition (418), are no less remarkable, the latter reminding one forcibly of Rejlander's "Two Ways of Life."

Mr. E. A. Levermore sends several large portraits, of which "Miss Filby" (354), is one of the best. Mr. Robert Harris' sea photographs are good (260), especially one broad expanse of sea, and a picture of the bow of a vessel forging a-head through some lively waves. A panoramic view of Cape Town (361), more than three feet in length, is also worth inspection. Mr. Hendrey's winter sketches (286) are the best of their kind in the exhibition; one of them, overlooking a frozen stream, we prefer even to the medal picture. A leaden sky is characteristic enough of winter, no doubt, but there are bright winter days as well as dull ones, and Mr. Hendrey shows us a sunny Christmas, with the snow on the ground, as most of us like to see it.

DANGERS OF PYROGALLIC ACID.

BY DR. T. L. PHIPSON.

Some time ago Dr. Napias, of Paris, who devotes much of his time ,to matters connected with hygiene, took up the subject of the hygiene of the photographer, and published in the *Moniteur de la Photographie* a series of papers which were afterwards translated into English and published by Messrs. Piper and Carter, of London. In them the worthy author has considered the action on the economy of the various poisonous substances which pass daily through the hands of our readers, and the best means of counteracting their influence.

Since then—in fact, quite recently—attention has been called in the medical journals to certain properties of pyrogallic acid which were perfectly unknown, and show that this substance, even when applied externally, may act as a violent poison, causing death by its great affinity for oxygen. I published a short note upon the subject in the *Journal of Medicine*, &c., for April last, and it may perhaps be useful to reproduce the facts here. Physicians who were unacquainted with this energetic deoxydising property of pyrogallic acid have proposed it as a substitute for chrysophanic acid in the treatment of skin diseases; but Dr. Neisser has made known a case of poisoning by an ointment of pyrogallic acid, which at once shows that considerable danger attends its use for this purpose. A man of strong constitution was admitted into one of the wards of the Breslau Hospital to be treated for general psoriasis. He appears to have been submitted to a kind of experimental treatment in order to test the curative properties of pyrogallic acid as compared with chrysarobine. He was treated by friction with chrysarobine (in the form of a pomade of alcoholic extract of rhubarb, containing one-twentieth) on the one-half of the body, whilst the other half was treated in the same manner by a pomade containing ten per cent. of pyrogallic acid. Six hours after the application the patient had violent shivering with vomiting and intense collapsus. Death occurred on the fourth day. Experiments were at once undertaken on rabbits, and proved that this catastrophe was due entirely to the pyrogallic acid pomade, and that the chrysarobine was innocuous. In some instances the rabbit died within two hours. It was also found that in the case of the patient in the Breslau Hospital the pyrogallic acid had acted by its extreme avidity for oxygen when in contact with alkaline fluids. The blood had been affected, and the red corpuscles were destroyed and turned brown. Very little urine was voided, but it presented a most extraordinary character, being dark brown and very thick; it contained no blood corpuscles, but a considerable amount of hœmoglobine (the colouring matter of the corpuscles), which was recognised by the absorption bands it gave in the spectroscope. The kidneys were uniformly bluish black. The blood had a dirty brownish red tint, and contained an abundance of *detritus* of red corpuscles.

This case points out once more that photographers cannot use too much prudence in dealing with chemical products which are in daily use by them, and the noxious properties of which they are apt to forget.

A PHOTOGRAPHIC HOLIDAY.

BY G. CHRISTOPHER DAVIES.

This year I devoted a fortnight's holiday to nothing but photography, and chose Wales as my destination. Armed with a half-plate camera and six dozen dry plates, I set out at the end of a week's heavy rain, fully anticipating that fine weather must follow. On my arrival at the country house on the borders, which was to be my head-quarters, the rain was still descending. The next day still it rained; but my brother (who was also an amateur photographer) and I amused ourselves by making a quantity of ferrous oxalate developer (which up to then had been my favourite), and in making instantaneous shutters, &c.; but, to our despair, it rained the next day, and, briefly, it rained every day but one during the fortnight. Of course there were momentary breaks and gleams of light, of which we duly availed ourselves; but, as a rule, the mist and the rain prevailed, and all our well-arranged plans were spoiled. We drove miles in the rain, and waited hours for a cessation; and, by so doing, and working hard and getting wet almost every day, we got a good many negatives.

Our first excursion was to Whittington (a charming, old-fashioned Shropshire village), where we took a view of a picturesque ruined castle and a timbered farmhouse of 1631, both fair negatives, although taken in slight rain. Then we drove to Oswestry, and waited for hours for light which came not.

Our next excursion was through Cragvorda Woods, and up to the lovely tarn of Coedygar, and the precipices of Cragyrhiw, a walk altogether of ten miles. My apparatus packs in a knapsack, and so was easily carried on my back. It blew hard, and when the wind lulled it rained; and though we exposed several plates, only two were good—one a wooden bridge over a stream in a wooded dell, with country children; and the other the fir-bordered tarn. I soon found that at least half as much exposure again was required in the sheltered valleys as on the open plains to which I had been accustomed.

Another day we took the train to Llanywchllyn, a station at the head of Bala Lake. Here, at the source of the Dee, we fell upon some exquisite bits of waterfalls and rocks and trees, and took good negatives. A Welsh hamlet, and a real ancient Welsh dame knitting stockings in the foreground, was the next subject; but, in the middle of the exposure, the old lady uttered an exclamation, and put her knitting behind her, evidently thinking it would spoil the picture. What the effect was we never saw, for, when taking the next view (one of the head of Bala Lake with the river running into it), I exposed the same plate again, and, not knowing it, spoiled two good pictures. The distant hills were hidden with mist, and this swept across us now and then, a slight shower hiding everything; and though in our walk along the lake side to Bala, a distance of four miles, we exposed several plates, the misty distances prevented any of them from being up to the mark.

Next we went to Llangollen, where every yard brings you to a fresh and most charming picture, and where there are better photographic subjects for small plates than in any other part of Wales. Vastness and grandeur of subject are not suitable for half-plate pictures; one rather wants a condensation of variety in a small space. We hired a donkey with panniers to carry our traps, and a donkey boy to drive it. There were several very heavy showers, but, in the intervals, the light was perfect, and we secured a large number of good negatives. We did not halt until we reached Valle Crucis Abbey, the finest ruins of the kind in Wales, upon which we expended all the plates in our slides. In order to change them we got into a sort of crypt and shut the door, blocking up windows, &c., with old sacking. Still there was light creeping in here, there, and everywhere. At last we dragged an old cask out of the heap of rubbish which filled the place, and one of us, getting his head and shoulders and a red lamp under, the other covered him up with focussing cloths and sacks, and the changing was safely effected, though at the cost of half suffocation. The operation occupied over an hour, during which time it rained heavily; then we walked on to the canal, and to its junction with the Dee, and exposed our stock again (I had three double backs). The next change was effected in the pantry of the picturesque inn at Berwyn, and four plates exposed on the way back to Llangollen, the difficulty being not to find a subject, but to choose between them.

The last plate was a race with the sun, which was sinking behind the Geraint, and in a minute after the exposure the shadow of the hill had reached across the valley, and half way up Dinas Bran on the opposite side. Altogether, I secured sixteen negatives, of which twelve were good, and the others printable.

Our next excursion was to Glandovey, a village among the hills on the south side of the estuary of the River Dovey. We went there by an afternoon train, and so cold and stormy was it, although the middle of August, that fires were lighted in the station waiting rooms. We had for lodgings a tiny sitting-room and bed-room in a cottage, where the man could not speak English. His wife could, however, and she made us very comfortable.

After our tea and ham and eggs, we ascended a hill of 1,400 feet in height, and witnessed a sunset over the broad estuary and the sea and the rugged mountains which for startling glory I have never seen surpassed.

In the morning it was actually fine and warm. My brother started up the hills to a mine where he had business, and I, with a boy to carry my things, went up the river Einion. Close by the village is a waterfall, of about thirty feet in depth, plunging into a black chasm, and forming a singularly beautiful scene. When the sun was shining the chasm was filled with a gleaming mist, which effaced the image on the focussing screen, and I had to wait for a cloud before I could take a picture. I took three different views of the fall, all good; then a view of a wooden bridge, with old houses and Scotch firs; another a wilderness of rocks and foaming water and fallen trees; and a sixth, a conglomeration of huge boulders, with waterfalls between—six plates exposed within 300 yards.

I changed by means of a mackintosh bag in which I placed one hand and the slides, working by feel. It was a very tiresome and tedious operation, but was accomplished without mishap. Another shot at a vista of rocky stream, bordered with ferns and hazels, and shaded by fir trees, and I made for the top of the hill, and took four distant views, two of which were excellent, and the other two thin. Then down to the river again, and found a fascinating picture, the main feature in which was a bridge formed of a single long fir tree thrown across for the footway, and a slenderer pole above it as a hand-rail. Of this I got a good negative. Of all the streams in Wales, I know of none which can give better pictures of the kind than the Einion. To reach it, go to Glandovey station, and walk a mile and a half to the Furnace, a massive smelting works, built in the time of Queen Elizabeth.

After this I walked up another long hill to the mine, and there I changed my plates, by going into the darkness of the mine, blowing the candle out, and changing by feel, with a respectful young Welshman intently wondering at my strange proceedings. We turned back to our lodgings, and had a dinner consisting of tea, potatoes, ham and eggs, and marmalade, and then took a train to Borth, on the coast, where we obtained some more pictures.

That night, after a four hours' railway journey, and walking about the hills all day, we arrived at Oswestry, too late to catch a train on the other line, and had to leave our things at the station, and trudge another four miles at midnight, arriving home dead beat.

Another day we went up a horse tramway into the Glyn Valley, and in the intervals between the showers took a few good negatives. One, indeed, was perfect, save that there are two women in it, side by side, and so exactly alike that everyone remarks it. The fact is that a woman, standing there "by request," knitting, stepped aside during the exposure, which was a long one, to better her position, and so she doubled herself.

Another day a transient lull in the rain lured us into driving some distance to Ellesmere, where I much wished to photograph some of the seven lovely meres in the vicinity; but down came the rain, and after waiting for hours and exposing two plates in the rain, we returned very much out of temper with the weather. Those we took showed the foregrounds sharp and clear, but all beyond the middle distance was lost in mist.

Other days we ventured forth, but returned dripping and disconsolate, with horses and carriages splashed and muddy. It was heartbreaking to see such lovely subjects all round us obscured by the continual mist and rain.

In one half-hour's bright interval I got two instantaneous views of pigs and poultry feeding, and all in motion, which are very clear and comical.

Altogether I obtained about four dozen creditable negatives under adverse circumstances; but if it had been fine weather, what a number there would have been

After I left, the weather immediately improved in Wales, and became delightful, but continued bad for several weeks in own own county.

I have said that ferrous oxalate was my favourite developer; but I found that my six dozen plates did not develop so satisfactorily as previous ones by the same maker had done, and on inquiry I found that the manufacture of them had been "improved," so as to suit pyrogallic rather than iron. So I took to Edwards' glycerine developer, and like it so much that I have given up the ferrous-oxalate. I find that with it and Edwards' plates I get negatives approaching the oxalate ones in colour, and with very clear shadows. I don't, however, like the bother of four bottles which this method involves, and would prefer the simple method of taking a spoonful of pyrogallic from its bottle and mixing it with water fresh, adding the ammonia bromide from a dropping bottle, provided the benefit of the glycerine could be retained by placing the water for mixing in a jug, and adding glycerine to this.

I shall be glad to hear what the more experienced readers of the News think of this suggestion. One advantage would be that the full quantity of developer could be placed on the plate at once, whereas with Edwards' plan of developing a plate which may be over-exposed, and so using a small quantity of the "accelerator," you do not at first get the plate well covered unless you use a wasteful quantity of the developer.

I had one cause of complaint against a well-known firm supplying photographic chemicals. I ordered from them a quantity of neutral oxalate of potash and protosulphate of iron, to make the ferrous-oxalate developer. Upon opening the parcels in a remote country house, I found that, instead of the protosulphate, they had sent the white sulphate of iron, and, on testing the oxalate of potash, we found it very strongly alkaline.

One word more. The advantage of rapid plates was made very evident to me the other day. I wished to photograph a Noah's Ark sort of boat, used by eel fishers on one of the Norfolk Broads, with its attendant paraphernalia of nets, wild-fowl guns, punts, and eel trunks, with the owner baiting his lines, and the whole framed by tall reeds; but it was blowing hard, and the only support I had for my camera and myself was a gunning punt two feet six inches wide, and dancing on the mimic waves. Yet, with an instantaneous exposure and large stop of a Ross' portable symmetrical, I got a beautifully clear and sharp negative, a casting net that was hanging on a pole, and swinging in the wind, showing the meshes plainly.

Notes.

Mr. J. W. Swan has been awarded a gold medal at the Paris Electrical Exhibition.

There is not a single example of ceramic photography in the Exhibition this year.

The velvet roller we have advocated for photo-lithography answers well for collotype; it does not drag the film, and consequently the plate lasts longer. For *Schnellpress* or mechanical printing, it is likely to be of considerable value.

Neither in Berlin nor in Vienna are there many highly-paid assistants. In London and Paris, five guineas a-week is no extraordinary salary for a first-class assistant in a first-class studio, while even seven and ten guineas are paid under exceptional circumstances; but we doubt whether, in the German-speaking capitals, more than four pounds sterling is ever paid.

One reason for this, no doubt, is, that the principal in Berlin and Vienna studios does the best part of the work himself; while with us, several heads of firms content themselves with the business management. To secure an artistic portrait, it is necessary to have an artist; and if you do not understand art yourself, you must perforce get some one who does, and pay him.

"The Storm in Bushey Park" might be the title of a grand photograph, if only somebody had thought of depicting the score of recumbent giants thrown down in their terrible encounter with the wind and rain last week. These stupendous trees, their maimed and broken branches strewing the path, and reducing the roadway in comparison to ridiculous proportions, was one of the most awful marks the storm left behind it.

One of these days we shall have photography regularly illustrating the events of the week, and special correspondents with cameras will make their appearance on every eventful scene. Our Saturday journals will contain, as a matter of course, photo-engravings of the "great railway accident," the "fall of a house in Cheapside," the "finish at the boat-race," "the favourite, rounding Tattenham corner," &c., &c.

"They are all made at Bridgewater," said Mr. York, the other day, telling us about his lantern transparencies. "We make about 50,000 of them annually, and, I dare say, more than half-a-million have been produced from the first, so large are the demands upon us. I always use collodion, and never have recourse to contact-printing; for one thing, it wears out the negative so fast. The slides are produced in the camera, and, therefore, can all be made to the same gauge, whether the original is a carte-de-visite or a fifteen-inch plate." One of these days we promise our readers to run over to Bridgewater, and chat over Mr. York's work in these columns.

According to *Nature*, Dr. Kalischer, who has been experimenting on selenium cells for the photophone, confirms the observation of Adams and Day that light may in certain cases set up in these cells a photo-electromotive force—the cell becoming its own battery. The same experimenter draws attention to a curious point, namely, that the sensitiveness of selenium cells to light is often greater in cells of high resistance than in those in which, by annealing, the resistance has been greatly reduced. A single cell kept for some months gradually lessened in resistance, while becoming less sensitive to light.

The Helvetic Society has been experimenting upon the photographic action of light in the blue lakes of Switzerland. With sensitized albumen paper, Professor Fore finds forty metres to be the limit of penetration of chemical rays below the surface of the water; but Dr. Aspen has by a different method—probably by using a bromide film—got a photographic effect in the Lake of Zurich as far down as ninety metres. These experiments give us some idea how light it is under water.

The idea of fixing indian ink drawings by a very dilute wash of potassium bichromate, and leaving the rest to the action of light, is thoroughly practical; the tint occasioned by the altered chromate being imperceptible, provided a sufficiently dilute solution has been used. One part of bichromate in two or three hundred of water is about the strength required.

Half a dozen pictures of a clown while he makes one leap is quick work; but Mr. Muybridge does not stop here, as he effects the successive projection of these photographs on a screen in the original order and time. The actual leap is, as it were, thus reproduced before an assembly, colour only being required to complete the illusion.

"When I was painting the scenery for *Dead Man's Point* at the Adelphi, some years ago, we got the War Office to lend us a lot of photographs of ambulance wagons and gun-carriages; and, by that means, we got very near reality, I can tell you." Thus, a cartoonist of one of our principal London Weeklies.

We have addressed the following to the Editor of *Engineering*:—

"Sir,—I see in your issue of the 21st inst. you refer to the 'lamp of Mr. Swan, which we were the first to describe a year ago.' It is a matter of very small importance, no doubt, but still it was in the Photographic News, I think, that the first description appeared, viz., on p. 302, June 25th, 1880. In company with Professor Herschel, of Newcastle, I was invited to a private exhibition of the lamp, and so thoroughly did I believe in its being the household light of the future, that I at once wrote the following paragraph, which appeared in the Photographic News of the week previously, viz., in June 18, 1880:—'Mr. Swan holds in his hand, apparently, the solution of the problem of lighting our rooms with electricity. Last week, at Newcastle, we passed several hours in a drawing-room delightfully lit up by a tiny lamp of Mr. Swan. He has succeeded in preparing a carbon thread or wire, and a loop of this material, maintained incandescent by the electric current, in a vacuum tube, supplies an exquisitely soft and steady light.' The description of the lamp followed on June 25.—Faithfully yours,

"The Editor of the Photographic News.

"5, *Castle Street, Holborn, E.C.*, 25*th October*, 1881."

Topics of the Day.

CHEAP AND EFFECTIVELY FINISHED ENLARGEMENTS.

BY GEORGE CROUGHTON.

In my last Topic on this subject, I said I would say something about colouring collodion transfers in a future paper. I now redeem my promise; first stating, by way of preface, that I have, since writing my last Topic, entirely given up collodion transfers as a basis for finished work, and use Morgan's gelatino-bromide paper instead, for I find that the enlargements are easier to produce, better in quality, and the gelatine surface lends itself to every kind of manuplation, both in black and white and colour, better than the collodion surface.

There are two methods of colouring these pictures quickly and cheaply: viz., in chalk, and with transparent oil colours. Water colour cannot be used to get good effects quickly, so I will confine myself to the two first named. The chalk is the easier managed by anyone not used to manipulating with colour, and, as the principle is the same, although the materials are different, the beginner may commence with the chalks, and afterwards apply his experience with them to assist him in using the oils.

In buying, ask for soft French pastels for portrait work; they can be obtained at any artist's colourman's, and are sold in assorted tints from three shillings and sixpence to thirty shillings per box; a three shillings and sixpenny box will be sufficient to commence with. A box of half-hard or Swiss crayon will also be wanted of assorted tints for decided touches, both for flesh and draperies.

In the limited space allotted to a Topic, it would be impossible to give more than the slightest description of the manipulations; it would take up the whole of the space in the News to go into the entire question of the combinations of colours most suitable for different complexions, &c The vignette is the best form of portrait for this style of colouring; the background should be nearly white to get the best effects.

We will suppose, then, that the enlargement has been mounted upon stout card, well rolled, and pinned upon a drawing-board. The picture should be moderately dark, with all the gradations fully brought out, the object being to let the photograph do all the work of drawing and shading, as by that means there is less danger of losing the likeness.

With the pumice powder (as described in my last Topic), rub evenly all over the print, and when every part has been gone over, dust off every trace of the pumice powder either with a tuft of cotton or a soft linen rag. Now take of your soft pastel the flesh tint which will nearest match the complexion of the sitter, and, taking a large piece of cardboard as a palette, crumble a little of the pastel between the finger and thumb upon it; rub the tip of the forefinger into the powdered crayon or pastel until it feels smooth, and then transfer it to the portrait, rubbing the flesh tint evenly all over the face. Do not mind if it goes over hair, eyes, or whiskers, as it can easily be removed with a little bread. When this is done, there should be an even tint of flesh colour all over the face, with the photograph showing through it, the shadows showing grey in contrast to the warm tint put upon it. One thing to be remembered in putting on this first tint is, that if the complexion is dark, it should incline to yellow; if fair, to pink. Having got on your local tint, take the pink pastel for the carnations, and crumbling it upon the palette as before, transfer it with the finger to the cheek, commencing at the line which begins at the wing of the nostril, working downwards towards the corner of the mouth, then upwards towards the ear, getting less of the carnations as you reach it. Repeat this with a deeper tint of the same colour upon the shaded side of the face, and soften and blend this into the local tint with the tip of the finger, using it as a stump. It will be found necessary, perhaps, to use the crayon itself in some touches near the nose—for instance, where the photograph is apt to be deeply marked. This must be done with the sharp edge of a fracture, since it is impossible to point these chalks, as they are too soft. As a rule, you will find the carnations, as sold, too pink for male complexions, and, in fact, most female complexions. This must be corrected with a little yellow ochre, or any other yellow not too bright.

It is now time to do something to the shadows, which now look colder by contrast to the warm colours laid on. Take the Venetian red from the Swiss or half hard crayons, and, after making a rough point upon a piece of coarse glass paper, carefully go over the deepest shadows, to warm them up in parts where they are very black; it may be necessary to use a brighter red to kill the black—even as bright a red as vermilion may be used for that purpose; of course a little of it will go a long way; remember that you must only use just enough to kill the black without making the red too prominent. This must also be graduated with the finger towards the lights, the grey of the photograph and the thin layer of colour blending together to make the warm grey tints seen in the demi-tints of the face.

It is now time to attend to the other parts of the picture. With the soft pastel, cobalt blue and light red, mix a bluish grey upon your palette, and transfer with the finger to the background, making it deeper and warmer near the head, and lighter and colder as it is graduated into the white of the vignette. This can be done in the form of clouds, and very pretty effects may be obtained by mixing various tints of grey, and graduating them one into the other with patches of blue to represent sky showing between. The local tint of the dress can now be put in; if a black coat or dress, a bluish grey can be rubbed all over, not forgetting to graduate it at the bottom into the white. The local tint of the hair can also be put in, and your picture will begin to look finished. Now comes the most important part of the work. First, clear off any flesh tint which may have gone over the eyes with a crumb of stale bread, moulding it to a point with the finger; deepen the pupils with academy chalk for light eyes, or Conti crayon for dark ones; if they are blue or grey, mark round the outside of the iris with the academy chalk; next put in the local tint with the fractured edge of the proper coloured crayon. Then, in the same manner, touch in the high lights and reflected lights; the line of the lash must be defined with the colour of the eyebrows, and the brows themselves put in broadly without attempting to mark out each separate hair. The hair must be marked out with a darker tint of the colour, whatever it may be, and with dark hair a little light grey may be touched upon the high lights. All these touches must be done as much as possible without after-touching with the finger, the object being to leave them firm and spirited. Mark the division between the lips with Indian red; touch the upper lip with light red and vermilion; the lower lip must be touched in with the carnation used for the cheek, shaded with light red; then the high lights upon the forehead, nose, cheek-bone, chin, &c., can be put in with a light-yellow, graduating where it may be wanted, but as little as possible; the deepest shades in black draperies can be put in with the soft Conti crayon; and if high lights are wanted (upon a silk dress, for instance), a light-bluish grey pastel can be used, touched with firmness and decision; white lace or linen can either be put in with white chalk or Chinese white water-colour: jewellery is also best touched in with water-colour. When there are cast shadows from the hair, &c., upon the flesh, they must be touched in with a light bluish grey for fair complexions, while for dark the grey may incline to greenish.

It will be seen from this description that a strong well-defined photograph has been overlaid with a semi-transparent colour upon the shades, while the lights gain body and crispness by being covered by solid colour. This is also the principle to be followed in using oils. But as this Topic has reached the limit for space, and the oil work requires at least as much space as I have devoted to the chalk, I will resume the subject in another Topic.

The gelatine photograph will require no preparation. After being rolled and pinned to the drawing board (of course omit the pumice powder), the background must be evenly covered with cobalt blue, light red, and white, thinned with megilp, laid on with a broad hog's hair brush in the same manner described for the chalk; but the gradations are best managed with a badger's softened, used as a dabber—that is, the tops of the hairs gently dabbed into the colour till it is spread and softened. When this is done, it should, for this class of work, require no more touching. Now, with a clean linen rag, wipe off the face, hair, and dress any of the background colour which has unavoidably gone over them, and mix upon the palette a semi-transparent flesh tint. With madder lake, yellow ochre, and a little Naples yellow No. 1, lay this on the face with a broad flat sable brush, using plenty of megilp, and even it with the badger used, as the other brushes are not dabbed as upon the background; in the same manner, using plenty of megilp, lay evenly the local tints of hair and dress, using Payne's grey for black draperies, very much diluted with megilp, letting the photograph find light and shade. Now for the carnations: take madder carmine and Naples yellow with a little yellow ochre, and put on as directed for the chalks, softening and graduating with the long hair of a flat sable brush. Now take another brush with light red, and go over the shadows, warming them up, using Indian red for the deepest; with a clean brush rub off the flesh tint from the eyes, and put in pupils with Cologne earth, local tints, reflected lights, high lights, &c., with these colours according to the sitter. It is now best to let this first painting dry before attempting any more. When thoroughly dry it can be finished. Always rub a little megilp upon the picture before commencing again, and if the flesh tints are too pink, a little yellow ochre in the megilp will make a great improvement; very little should be needed now to pull the picture together. The line between the lips should be marked in with Indian red, the upper lip lightened with a little vermilion, the shadows of the hair deepened, touching in the shadow of the dress sharply with blue black. Then the high light upon the eyes, and perhaps the reflected light, may want brightening; the high lights upon the face touched in with solid colour, Naples yellow, madder lake, a little yellow ochre, and perhaps a little white; but do without white in the flesh if possible. The carnation may be brightened, and the lower lip put in with madder lake and Naples yellow, shaded with Indian red, a little vermilion, and Naples yellow. Linen and lace must not be painted in with pure white, but a mixture of white and Naples yellow. The shadows should be a greenish grey, cobalt, and yellow ochre, with Naples yellow. This greenish grey can also be used for cast shadows next the hair upon the face, &c., but the idea throughout this class of work is to do as little as possible to the shadows, letting the photographic shadow show through the colour. If this is done, there will be quite grey enough upon the face; in fact, the beginner will find that one of the greatest difficulties is to get rid of the grey without doing too much to the picture.

The "Topic" for next week will be, "M. Garnier's New Method of Photo-Engraving," by Major J. Waterhouse, B.Sc.

METHOD OF MIXING GELATINE EMULSIONS.

BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

In common with most others, I have always laboured hard, when forming a gelatine emulsion, to get the *very finest* possible precipitate of silver bromide. If we consult back literature on this subject, we shall find that many elaborate pieces of apparatus have been devised from time to time in order to allow the silver nitrate to come in contact with the gelatine in which the bromide was dissolved, as the finest spray. No doubt such might be absolutely necessary under certain conditions; but I must confess that the method that pleased me best till recently was by forming a froth in gelatine by whisking or shaking, and then adding the silver nitrate solution drop by drop. This gave a splendidly fine precipitate of the bromide, but then it took time. By any method, it has happened to me that at times the ruby colour of the emulsion, when looking at a gas flame through it, has not been as deep as at others. We may presume that the sensitiveness of an emulsion, after boiling, depends upon the attainment of this ruby colour before boiling, and it should be striven to secure it at any amount of trouble.

It will be recollected that when I gave my formula for preparing a gelatine emulsion by precipitating in water, or glycerine and water, I insisted on adding the bromide solution to the silver solution, and not *vice versa*. Numerous experiments before that time had shown that precipitation in this way gave much finer particles than the usual way of proceeding. I had always dreaded applying this method to gelatine emulsion when precipitation was to take place in a gelatine solution, and some experiments I had made in this manner had not encouraged me to proceed further in that direction. In my recent experiments with collodio-chloride I have been much struck with the superiority of the "bromide-into-the-silver" method, and tried it when preparing gelatino-chloride, and with the most perfect success; the emulsion was in every respect excellent. I then plucked up courage to try it with the bromide, that is, by adding the bromide dissolved in the gelatine solution to the aqueous silver solution, and also with success, until one occasion, when apparently a good deal of the bromide was thrown down; still, what was left in suspension was of the right colour, and the plates in all cases were perfectly free from fog, red or green.

It then occurred to me that a modification might be adopted, viz., to dissolve the gelatine in part of the water, the silver nitrate in another part, and the bromide in the water usually allotted to the silver. In the *dark room*, then, the silver was added to the gelatine, and the bromide gradually poured in, with much shaking. The resulting emulsion was beautifully ruby-coloured when examined by gas-light, and, I think, with reasonable precaution, failure to obtain that colour would be impossible. For the sake of convenience, I may put down the formula I used—

1.—Soft gelatine	30 grains
Water...	1 ounce
2.—Silver nitrate	200 grains
Water...	1 ounce
3.—Potassium bromide	170 grains
Water...	1 ounce
4.—Potassium iodide	10 grains
Water	2 drachms

Nos. 1 and 2 were mixed in the dark room; then No. 3 gradually added, and finally No. 4, after which it was boiled. This is a small modification, but it is worth trying.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The "Technical Exhibition Meeting" of the South London Photographic Society will be held in the large room of the Society of Arts, John Street, Adelphi, on Thursday evening, November 3rd, at 8 p.m. Admission free.

I am directed by the Committee to invite you to exhibit and explain any novelty or modification of existing appliances, however small or simple in character they may appear to be, which you may have, in connection with photography and its application.

The Sub-Committee beg to call attention to the Rules framed to facilitate business, in order that all subjects brought before the meeting may receive adequate attention:

1. That papers be allowed to be read (which must be as short as possible, and as much to the purpose as can be written), such papers to be sent to the Secretary on or before Nov. 3rd.

2. That opportunity be granted for practically working a process, or making an experiment, consistently with the time at the disposal of the Committee.

3. That secret processes or patented articles, with the name of the inventors, and their objects, be only briefly stated by the Secretary or by a member of the Committee.

4. That explanations be allowed, but only absolutely in reference to the practical uses of the articles shown.

5. That questions may be asked of exhibitors, referring only to a clearer understanding of the subject; but that no discussion be allowed respecting objections or differences of opinion on any matter.

6. That packages be delivered, free of charge, by six o'clock on the evening of the meeting, the exhibitor to arrange for clearing away the same.

The meeting for members will commence at 7·30 p.m. for the nomination of officers for the ensuing year.—Yours faithfully,

H. Garrett Cocking, Secretary.

26, *The Parade, High Road, Lee, S.E.*

ON THE QUANTITY OF SILVER USED UP IN DIFFERENT PHOTOGRAPHIC PROCESSES.

BY DR. J. M. EDER.

At pages 369 and 383 in recent numbers of the Photographic News, different correspondents have compared the cost of the wet collodion and of the dry gelatino-bromide process, and have shown that collodion plates are much more expensive to work with than gelatine plates, though, when the emulsion is made at home, the difference appears to be slight. By means of some experiments which I have recently undertaken, I have been able to throw some light on this among other questions. From the quantity of silver bromide in a number of gelatino-bromide plates I computed the amount of silver which they contained before being developed, and then I determined the quantity of silver in various negatives after developing and fixing. The plates were divided into groups; those which were coated with so thin a film that a good image could only just be obtained on them I call the *Minimum*, those having a moderately thick film the *Medium*, and those with an abundant coating of great thickness the *Maximum*. One of these plates, with a film of only minimum thickness, is feebly transparent. In order to get an average, ten plates out of each group were examined, and the mean of the figures thus obtained was calculated; in each case, the result was reduced to a plate of 100 square centimetre surface.

Table I. compares the amount of silver contained in the sensitive film, and in the finished and fixed negative image, in the dry process with gelatino-bromide; in Vogel's emulsion; and in washed collodion bath-plates, which last represent the dry process formerly employed.

Table I.

		Gelatino-Bromide.	Vogel's Emulsion.	Washed Collodion Bath-Plates.
Total weight in grams of the dry sensitive film on 100 sq. centim. surface ...	Minimum	0·150	——	0·022
	Medium	0·20 to 0·30	0·104 to 0·136	0·04 to 0·058
	Maximum	0·392	——	0·073
Weight in grams of metallic silver in the sensitive film on 100 sq. centim. ...	Minimum	0·052	——	——
	Medium	0·07 to 0·10	0·06 to 0·02	0·013 to 0·02
	Maximum	0·134	——	——
Weight in grams of silver in the developed and fixed negative of 100 sq. centim. surface	Very weak image with oxalate	0·004 to 0·007	0·104 to 0·136	*0·0032 (with pyro.)
	Normal image with oxalate ...	0·012 to 0·02	——	——
	Very dense image with oxalate	0·022 to 0·028	——	——
	Normal image with pyro. ...	0·008 to 0·010	0·008	——

* Images of this kind keep very thin even after long developing.

An inspection of this table shows that the collodion bath-plates contain the smallest amount of silver, but that only very thin negatives can be taken with them. It appears, also, that in the whole film there is not sufficient silver to give a vigorous negative; in fact, collodion bath-plates are deficient in silver. A very vigorous negative contains from four to five times as much silver as a very weak one, and nearly twice as much as a normal image. The thinnest gelatino-bromide plate that can be used in practice contains enough silver to give a vigorous negative. In fact, a slightly transparent emulsion film is sufficient for the purposes of a portrait photographer, though it is not adapted for copying drawings.

The analysis of the fixed images shows that very few milligrams (from 10 to 20) of silver are required to render an image of 100 sq. centim. surface—about the size of an ordinary *carte-de-visite*. It is also shown that with the alkaline pyrogallic developer the negative image does not need to contain so much reduced silver as with the ferrous oxalate developer, owing to the fact that the former reduces brownish, or—photographically—better covering, silver, while by the latter it is formed in a bluish black state. This is well known to photographers, for they keep their negatives thinner for the pyrogallic developer than those for the ferrous oxalate. According to my analysis, as shown in the table, the negatives, in the first case, contain from two-thirds to a half as much silver as in the second case.

Further, it appears from Table I. that a plate can be sufficiently thickly coated with only a moderate quantity of silver bromide. I present my readers with the following formula (determined empirically, and not following from the figures in the table) for coating a plate with a sufficient quantity of silver bromide emulsion. With my own emulsion, which is tolerably rich in silver (about 4·5 grams of silver nitrate to 100 cubic cents. of emulsion), about 0·04 cubic centimetre of liquid emulsion is enough on an average for coating a surface of 1 square centimetre. If the emulsion is not so rich in silver, more of the emulsion must be poured on the plate; for instance, Forrest uses 0·06 of his emulsion to every square centimetre of plate. According to my analysis we may go still further, and use even less silver bromide emulsion; but in that case, to make the manipulation easier, we must add more water and gelatine.

The following Table II. shows the composition of a wet collodion bath-plate with the adherent silver from the bath.

Table II.

		Grams.
Weight of a collodion film of 100 sq. centim. containing iodo-bromide of silver		0·040 to 0·058
Weight of metallic silver present in 100 sq. centim. ...	*a.* In form of iodo-bromide of silver	0·012 to 0·020
	b. In form of silver nitrate adhering from the bath (1·10)	0·03 to 0·05
	c. Total quantity of silver ...	0·042 to 0·07
Weight of silver in the developer and fixed normal image of 100 sq. centim.		0·0093 to 0·014

From these results we see that wet collodion plates derive the principal portion of their silver from adherent nitrate of silver solution of the bath; also that the total weight of silver is not so great as in the case of gelatino-bromide of silver plates with a film of medium thickness, and is certainly much smaller than in the case of thickly-coated gelatine plates. In the finished and fixed negative on a collodion plate the weight of silver is about the same as in that on an emulsion plate. The quantity of silver contained in an image produced by the wet process is entirely due to the adherent silver solution.

When we investigate how much of the silver attaching to the plate is used up in the production of the photographic image, and how much is carried off as useless in the fixing solution, &c., we obtain the following result:—

Table III.

Of the total quantity of silver employed in the preparation of the plate, or of paper, there is used up—

	In the gelatino-bromide process per cent.	In the collodion process per cent.	In the positive albumen process.[*] per cent.
a. For producing the image... ...	... 16 to 21	... 20 to 21	... 3[†]
b. Carried off in the developer and wash water	... 0	... 50	... —
c. Carried off in the fixing solution	... 74 to 79	... 27 to 30	... 30 to 25
d. Carried off by the draining paper	... 0	... 0.8 to 2	... 1
e. Carried off in the wash water	... 0	... not separately determined	... 50 to 55
f. Loss in draining, trimming, &c. ...	...	...	... 6

These figures show that of the three processes most generally employed in photography, the wet collodion process not only requires the smallest amount of silver for the preparation of the plates, but that also in this process the silver actually employed is turned to the best account. When gelatino-bromide plates are carefully prepared, the quantity of silver used up is almost the same as that in collodion plates; consequently, from an economical point of view, the gelatine process is not greatly inferior to the collodion process. It is also interesting to notice how much smaller is the proportion (5 to 7 times) of really effective silver in the positive printing process on albumenized paper.

It should also be noticed that in the gelatino-bromide, as well as in every other emulsion process, $\frac{3}{4}$ of the total quantity of silver employed passes into the fixing solution; that is to say, the whole of the silver not actually used in forming the image. In the wet collodion process, on the contrary, the conditions are quite different; in this case by far the larger proportion of the silver consumed passes off with the developer in the wash water, and only from $\frac{1}{8}$ to $\frac{1}{4}$ in the fixing bath, and the same holds good also in the positive albumen process.

Special attention should be directed to these facts, since there are not a few photographers who throw away their fixing baths after they have finished with them, not deeming it worth the trouble to recover the silver from them, though they may save their waste developing solutions. Manipulation of this kind causes in the wet collodion process the loss of at least one-half of the waste silver; in the gelatine process the circumstance would be still more unfavourable, since the whole of the waste silver would be thrown away.

A PARIS STUDIO.

Mr. G. R. Sims, whose name is just now prominently before the public as the author of the "Lights o' London," the "Half-way-House," and other successful dramas, thus writes in the *Referee* under the well-known name of "Dagonet":—

I have always had a great horror of being photographed. Many a time have I risen, donned my gayest attire, practised a smile before the looking-glass, and cricked my neck in a wild endeavour to see in the mirror which side of my face was the more imposing. Then, after a dose of steel, to strengthen my nerves, and a final struggle with a necktie that would ride up and hide the line of white so necessary in a photograph, I have sallied forth with a desperate resolve to face the operator and his ungainly instruments, only to turn back at the very threshold, smitten with a sudden spasm of terror which I can only compare to that which I used to experience as a boy when I had to have a tooth out, and had got as far as taking hold, very gingerly, of the bell-handle at the dentist's front door.

But at last I have got the better of my fears. Strolling along the Boulevards one day this week, I determined to be photographed. When I got as far as the artist's studio, on the second floor of a mansion on the Boulevard des Capucines, I seized the bell, and rang it fiercely. It was the energy of despair. I knew that if I didn't ring that bell at once I should turn round and fly ignominiously. Before I could recover from the surprise caused by my own audacity, I was bowed into a sumptuous apartment by a beautiful male being, who coaxed me from the door-mat as a fond mother coaxes the little one she is teaching to walk. The being was so polite, so gentle, so reassuring, that having stammered out, "Please, I want to be photographed," I felt quite bold and brave, and prepared myself with confidence for a new experience.

It was a new experience. O, photography, fie! Henceforth I have lost all faith in portraits of celebrities. I have come out so exquisitely lovely myself under the manipulation of a fashionable French artist, that I sit all day in dreamy abstraction, and gaze on my counterfeit presentment. I sat for it, but is it—can it be me? Gather round me, friends of youth, gentle readers brave and fair, swear never to betray my secret, and I will tell you how it was done. Photography is so popular now in all its aspects, and is of such general interest to all classes, that I feel sure a visit behind the scenes of a beautiful-for-ever artist in portraiture will be welcome. Here is the "Conversation with Incidents" as it actually occurred.

Scene.—A Photographer's Studio in Paris. *(Victim discovered sitting very uncomfortably in a high chair, his head screwed into a vice, and his eyes gazing fearfully into the cavernous depths of the machine.)*

Operator—One moment; the beard of monsieur will come out too dark. Alphonse, some powder on the beard of monsieur. *(Assistant puts flour on beard and hair of victim.)*

Victim—But, here, I say, my hair isn't white.

Operator—Ah, pardon, monsieur; it will come out most exquisite. Alphonse, bring out the nose of monsieur a little more. Monsieur has an exquisite nose! *(Assistant puts shade on each side of victim's nose with a brush.)*

Victim—Really, I——

Operator *(looking through the machine at victim.)*—Excellent! The eyebrows of monsieur are a little light for a good picture. Alphonse, some more eye brows for monsieur. *(Assistant puts on more eyebrows, with something in paper that looks like a brown sugar stick.)*

Victim—I won't be painted up like this! I——

Operator—A little colour to the cheeks of monsieur.

Victim—Sir! I am not a clown. I am an English journa——

Operator—Ah! Rest like that, monsieur. The pose is excellent—distinguished. It is animation the most perfect.

Victim—*(afraid to move for fear the photograph is being taken)*—Am I being taken?

Operator—No, monsieur. Ah—the expression a little more gentle, please.

Victim—I decline to grin. I do not grin naturally.

Operator—Ah, monsieur must not elevate the left eyebrow.

Victim—But I always elevate my left eyebrow. The great English caricaturist, Mr. Alfred Bryan, has——

Operator—Pardon, monsieur, you are not sitting for a caricature. Ah, so; remain like that. It is very pretty as movements, very pretty as expression—so smile at me—charming. I commence!

(Victim has forty seconds of marble statue and fixed agony, and wonders whether he has an idiotic grin on him or a fierce frown.)

Operator—It is finished!

Victim—Thank goodness! *(Shakes himself up, relaxes his muscles, breathe freely, and bolts down the stairs and into the street.)*

Crowd in the Street—Ah! see there what a strange figure—an Englishman with flour in his whiskers, black round his nose, and red on his cheeks.

Victim—Great heavens! I've forgotten to wash my portrait off. *(Leaps into a closed carriage and is driven rapidly to his hotel.)*

---

[*] The amount of silver in pictures on paper is small; according to Pohl, albumen pictures contain only 0·11 per cent. of silver.

[†] According to Davanne and Girard.

True, every word of it, *mes amis*. But the photograph is a compensation for all the torture I endured. It doesn't look like me, but is the portrait of an exquisite being whose nose and mouth and expression have been artistically manufactured to make them look at their best.

Correspondence.

BURNISHING AND ROLLING PRINTS.

SIR,—I should esteem it a favour if any of your readers could help me by giving their experience of burnishers and rolling presses.

I have an ordinary burnisher, but what with scratches and sticking, it is a source of constant annoyance. Are the hot rolling presses superior to burnishers? or what is the best machine for glazing portraits.—I am, sir, yours faithfully,

J. GRAY.

[The subject Mr. Gray refers to is an important one, and we shall be glad to hear the experiences of others.—ED. P.N.]

THE PHOTOGRAPHIC SOCIETY, AND COMMERCIAL DRY PLATES.

SIR,—I beg to inform your readers that I have addressed a letter to the President and Council of the Photographic Society of Great Britain on the question of "commercial dry plates." The queries put in this letter to the Parent Society must be of great interest to the whole photographic public, whether amateur or professional, who use commercial dry plates in any form.

As a photographer of some fifteen years' standing, and a member for some years of the senior Photographic Society in Great Britain, I consider that questions such as I have laid before the Council of the Parent Society should be answered with all the publicity possible, both for the credit of science, and the credit no less of commercial honesty as relates to a large number of makers and dealers in photographic commercial dry plates.

Photography now enters into so many professions and sciences (medicine, astronomy, the microscope, the War Department, and the aeronaut, all seek its aid), that it is most important to know whether or not there is, at the present day, any dry-plate process in existence which can be relied on for reasonable uniformity of results, and which can be supplied to those competent to use it at reasonable prices.

The unreliable character of so many of the gelatine dry plates now continually sold to the public by so many dealers, lead the photographic public naturally to turn to the chief Photographic Society in Great Britain to speak with authority on this important question.

FRANCIS WILLIAM TURTON, Commander, R.N.

THE PHOTOGRAPHIC EXHIBITION.

SIR,—"A. L.," in last week's PHOTOGRAPHIC NEWS, has done good service in calling attention to the faulty preliminary arrangements of the Exhibition.

I quite agree with him that there is a greater chance of exhibits being placed in a favourable position if sent in late, as the earliest are covered up by the later, and do not receive the first notice. A friend's exhibits were sent in on the day named, but they were not seen by the jurors; neither does his name occur in the list of exhibitors.

The Council once made an excellent rule, but never acted upon it, viz., that exhibits sent in after a certain date would be excluded from competition. Until this rule is put in force, I should recommend exhibitors to take no notice of the date advertised, but send in two days before the opening.

IPSE DIXIT.

[We personally can vouch for it that the rule made by the Council was *strictly* enforced some years ago.—ED. P.N.]

SIR,—As "A. L." in his letter of last week revives the old, old story of "skied" and "floored" pictures, I must say I fully appreciate all he says on the subject. I condole with him on this vexatious matter. We all know it is an evil not easily dealt with, when exhibits are numerous, and room limited. Granted there are many that might, with justice, be thrown out; but the committee, anxious to give all a chance, hang them in the only available places, a decision not unwise where room is plentiful and the work not altogether void of artistic feeling; a comparison with better work ofttimes makes a bad exhibit this year a good one later on. One thing I do think might be properly attended to, and that is the correct printing of the catalogue. Is it not most annoying to find strangers credited with one's own work? Still more so, when we see in the daily papers flattering accounts of certain works that have been the labour and study of months to bring to perfection, spoken of as the work of a totally different being. We are asked to furnish full details with every work sent in. When this is done to the letter, then no key to pictures that absolutely want them is given for the guidance of visitors? Who is to blame for all this? If the hanging is at fault, surely the catalogue might be rightly printed.—Yours obediently,

CHARLES WYRALL.

Proceedings of Societies.

THURSDAY EVENINGS FOR PHOTOGRAPHERS.

AT the meeting held on the 20th inst., the chair was occupied by Mr. W. B. PRESTWICH.

Mr. SIMMONS, the well-known aeronaut, exhibited some negatives said to have been taken from a balloon at a height of six hundred feet on the previous Saturday; unfortunately, both negatives were indistinct, and in one was a large insensitive mark extending over three-quarters of the plate; this was attributed by Mr. Simmons to a volume of sulphurous smoke which was issuing from a factory chimney at the time of exposure; but on closer examination it looked very much like part of the head and shoulders of a man. Perhaps Mr. Simmons thought he could smoke the meeting.

Mr. ARCHER CLARK exhibited a Kent's Braun press which he had converted for breaking up emulsions, by removing the bottom, and substituting a copper wire gauze of sixteen meshes to the linear inch; it was black varnished inside and out. Mr. Clark said he could press forty ounces of emulsion through in about two and a-half minutes.

Mr. DEBENHAM said he had had a strainer very similar to that shown by Mr. Clark in use some time back, but he found that the string of the emulsion clung together after passing through, and that he had to press it through several times.

Mr CLARK said he always found once was sufficient.

Mr. HENDERSON exhibited a gauge for cutting prints of irregular sizes, which will be illustrated and described in our next; he also showed a negative, one half of which only had been exposed; it was developed in the usual way, and found to be green fogged, the unexposed half being the worse; and then one-sixth part of the whole negative was immersed in a weak solution of hypochloric acid, and another one-sixth part, on the opposite side, in a solution of ammonia and bromide for two minutes respectively, and then fixed in hyposulphite. In that portion which had been subjected to the hydrochloric acid solution there was no trace of green fog in either the exposed or unexposed portions, but in that part immersed in the ammonia and bromide solution the green fog was more dense than in the centre portion, which had not been subjected to either the acid or ammonia and bromide solution.

Mr. LE FEVRE said it had been suggested to the Council of the Balloon Society that an International Photographic Exhibition should be held at the Royal Aquarium; and asked those present to express their opinion as to the feasibility or otherwise of the scheme.

Mr. HENDERSON suggested that in addition to the exhibition a convention similar to that just over at New York should be held.

Both schemes were favourably received by those present (in fact, one gentleman went so far as to promise that should a convention be held, he would himself send six new inventions); and after some discussion the question was adjourned till the next or following meeting.

BRISTOL AND WEST OF ENGLAND AMATEUR PHOTOGRAPHIC ASSOCIATION.

The Annual Meeting was held at the Association's Studio, Portland Street, Kingsdown, on Wednesday, 5th inst., at 8 o'clock, Mr. C. Phipps Lucas in the chair. Mr. Walter Hughes, Jun., of Clifton, was elected an ordinary member.

The Honorary Secretary then presented the Annual Report, in which special mention was made of the eminently successful International Exhibition held at the Academy of Arts, Queen's Road, in December and January last, and which was admitted to be one of the most important, if not the most important, ever held.

The Council desired particularly to notice the studio now complete and fully appointed and provided for the members of the Association on payment of a small extra subscription; it was hoped many would avail themselves of this decided advantage. Competition medals for ideal subjects have been instituted.

The Chairman considered the Association was to be congratulated on its still flourishing and prosperous condition, and was very glad that the number of members kept increasing; the only matter to be regretted was the failure of the outdoor meetings; but, of course, it was due to the weather, and not to any other cause. He also felt sure that any member on seeing the Association's studio would at once desire to become a subscriber. On being put to the meeting the report was adopted *nem. con.*

All the officers were re-elected.

Mr. H. A. H. Daniels, in returning thanks, said he should have been only too pleased to hand over the secretarial duties to another had the meeting thought fit, but as they had been good enough to re-elect him, he was quite prepared to continue to do his best in the interests of the Association.

Mr. E. Brightman, the Hon. Treasurer, also thanked the meeting.

Mr. C. Phipps Lucas was elected on the Council.

It being the first meeting held in the Studio, the members present inspected the dark rooms, apparatus, dressing room, and appointments generally, and, before leaving, all had given in their names as subscribers.

Talk in the Studio.

On a Swing.—Mr. Griffith Medley, of Ventnor, sends us a little picture, taken in his studio, in proof that Messrs. Downey do not enjoy a monopoly of the accessory in question.

Visit to a Gosport Studio.—In his English correspondence in the *Moniteur de la Photographie* of the 16th October, Dr. Phipson alludes in the following terms to a visit which he made, a short time ago, to Portsmouth:—"Messrs. G. West and Son, of Gosport, Portsmouth, have succeeded in applying gelatine plates to the production of a panoramic proof of Portsmouth Docks. This colossal proof is not less than about a yard and a-half in length, and is composed of eight negatives taken on quick gelatine plates of large size. The exposure of all these plates was nearly instantaneous, so that every wave, every wreath of smoke, every bird, &c., is seen as in nature. It is an incontestable success from every point of view. When we think of the immense number of objects, steamboats, men-of-war, vessels of all kinds in construction, without mentioning the historical monuments such as the old ship *Victory*, on which the gallant Nelson died, the *Wellington*, and the school ship *St. Vincent*, and a host of others—when we think of all this, we may easily imagine the courage which Messrs. West must have summoned in order to attack such a subject; the more so, as these photographers have since gained a great reputation for their portraits. They were among the earliest to adopt the gelatine plate in portraiture, and it would be difficult, if not impossible, to surpass the excellency of their work. Thus the practice of Messrs. West and Son has become very considerable; and last week, when I had occasion to visit Gosport, they were printing a thousand proofs a day!"

The Photographic Society's Exhibition.—This Society's artistic feast is this year to a great extent served up on gelatine "plates," and judging from the general success of the *menu carte* (not to say cabinets), it is not correct, in any sense, to assert that the gelatine process is no great "shakes"! One of the "medal" pictures (No. 268), "The Old Boat," is a proof that

"H. P. Robinson, he
Can show us new beauties away down the Dee."

It is Dee-sidedly one of the best pictures in the Show. Mr. W. Bedford takes a medal also; but as he always does his level—nay, his Bedford-level best, we are not surprised at this. Some Animal Groups (No. 384) are very animated and fine; in fact, we think the "Study of the King of Beasts" deserved, if not a medal, at least a "medal-lion." A third medal-taker is Mr. W. England, who has wisely taken the poet's advice to heart, for "'England' to himself is ever true." On the whole, the thousand or so specimens exhibited are admirable; and we can sincerely say that "hanging" is not too good for the vast majority of them.—*Funny Folks.*

To Correspondents.

⁂ Correction.—In our issue of September 23, p. 449, we inadvertently credited the "Hints on Saving Silver and Gold Wastes" to the *Philadelphia Photographer*, instead of the New York *Photographic Times.*

⁂ A cheque for two guineas will be paid for the best practical article on "Photographic Residues and Waste; What is worth saving, and how I save it." The name of the author need not appear. For rules, see previous numbers of News. Contributions must reach this Office by the 1st November.

⁂ Press of matter compels the postponement of "By-the-Bye" this week; the next "At Home" will be "Dr. J. M. Eder at the Imperial Technical Academy, Vienna."

Would-be Photo.—It is not easy to find a market for the negatives, but for prints of the class you refer to there is a ready sale, provided you are prepared to accept an extremely low price—less, in fact, than an ordinary silver printer would require for producing the copies. When a picture possesses notable artistic merit, or the subject is of especial interest, the above remarks no longer hold good, and the negatives can be readily disposed of for a reasonably large sum.

Chas. A. Long.—Write to Mr. Jarman. His address is 10, Glenarm Road, Lower Clapton, E.

Major R. Gordon.—1. A Winchester quart is eighty fluid ounces, or two ordinary quarts; but the term "Winchester" is ordinarily applied to a glass bottle which holds about eighty fluid ounces. 2. The subject is an important one, and will receive due attention.

H. S.—1. It would require 7¼ drams of ammonium bromide. 2. Exposure to the heat of boiling water for twenty to thirty minutes.

Polaris.—Please give chapter and verse, as we do not commit the whole of the Photographic News to memory.

Tyro.—By far the best course would be to make a fresh bath, and to recover the silver from the old solution.

E. F.—1. Expose the bottle containing the bituminous solution to the long-continued action of light, as under those circumstances the preparation becomes much more sensitive. 2. Such proceedings have been suggested, but the advantage is doubtful. 3. You might try albumenizing the plate.

W. H. M.—Take care that the film is quite dry, then coat with plain collodion; again, be sure of absolute dryness, after which varnish with the following:—

Saudarac	1 ounce
Shellac	½ "
Venice turpentine	¼ "
Oil of lavender...	1 drachm
Alcohol	10 fluid ounces

Finally add castor oil, ½ drachm.

Belvedere.—1. At the present time there is no better method known than that which you refer to; but we understand that Dr. Eder is now working on the subject. 2. You should try the process with the lantern you mention.

G. T. H.—It is impossible to offer an explanation without knowing all the circumstances. Write to the manufacturer of the article.

Novice.—1. No light is absolutely safe, and it is therefore advisable to expose the plates as little as possible, even though you work with double ruby and a thickness of orange. 2. It is undoubtedly possible, and, what is more, we have seen a plate successfully removed from the slide and developed in an ordinary sitting room lighted with gas. In this case, however, the work of removal was performed with something approaching the dexterity of a prestidigitateur, and all available means were used to protect the plate from direct rays or reflections.

Carbon.—It is a lime soap prepared by dissolving Castile soap in water, and adding a solution of calcium chloride; the precipitate being then washed and dried.

M. Saunders.—No one position can be specified as a suitable position for the sitter. Try and study various positions and lightings with different subjects, taking photographs of those poses which appear to possess the most merit. When you have practised in this way for some time you may try your hand at imitating the lighting and posing of good portraits, whether photographs or not.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1209.—*November* 4, 1881.

CONTENTS.

PAGE
Instantaneous Shutters 517
Silver Printing and Toning 518
The Photographic Exhibition 518
Dr. J. M. Eder at the Imperial Technical Academy in Vienna 520
A Simple Curtain Shutter for Landscapes, &c. By R. B. Gilson 521
Notes 522

PAGE
Topics of the Day.—M. Garnier's New Methods of Photo-Engraving. By Major J. Waterhouse, B.S.C. 523
On Enlarging View Negatives with a Home-Made Apparatus. By H. J. Palmer, M.A. 524
Correspondence 525
Proceedings of Societies 527
Talk in the Studio 528
To Correspondents 528

INSTANTANEOUS SHUTTERS.

In our last article on the above subject we showed that, to obtain the greatest possible equality of illumination, it is necessary that the shutter should be placed between the combinations of the lens, and should open and close at the centre. These, then, are two of the conditions necessary to be fulfilled in an ideal shutter. Another condition (which we gave in a former article) is, that the length of the aperture should be considerable in the direction in which the shutter moves. There are one or two other conditions which should be satisfied, and which we shall mention.

The following are a set of conditions set down by C. I. Burton in a paper read before the Edinburgh Photographic Society, about a year ago.

"1. The shutter must be able to give a short exposure.

"2. It must be able to give a variable exposure.

"3. It must be able to give a definitely variable exposure; that is, it must be possible to set the instrument to give an exposure equal to any required fraction of a second.

"4. It must not be possible that it should shake the camera. I believe no shutter can be certain of fulfilling this condition unless it has two equal moving parts, which move in opposite directions. There is a law of nature which says action and reaction are equal, and in opposite directions; and, unless the camera be absolutely rigid, which is impossible, the camera must move, to a certain extent, in the opposite direction to the moving part of the shutter. True, this motion may be so small as to be imperceptible; but it must exist, and it seems to me it would be better to eliminate it entirely by making the two reactions of two moving parts counteract each other.

"5. The aperture which passes in front of the lens must be several times as long, in the direction of its motion, as the diameter of the lens . . . ."

The first of these conditions is of course understood by the very name of the instrument; but it may be worth while to say a few words as to the minimum length of exposure which it is desirable to give. We think that the length of exposure given by the shutters commonly in use has been very much under-estimated. We have worked out the theoretical speed of several shutters, which are said to give exposures sometimes as short as 1-200th part of a second; and we have found that the shortest exposure with such of them as are constructed for lenses of considerable size, and have the length of opening not less than the diameter of the lens, is at least 1-50th of a second. This, we say, is the theoretical length of time; but when air friction and the friction of the moving parts are taken into account, the exposure must be still longer. It must be borne in mind that when the motion is accelerated by any kind of spring, the speed will only increase as the *square root* of the increase of the tension; that is to say, to half the exposure the tension of the spring must be increased four-fold. To reduce it to a third, the tension must be increased nine times.

We do not wish it to be understood that we think it desirable that shorter exposures should be given. On the contrary, we consider that except for sensational, or very exceptional subjects—such as express trains—1-30th of a second, or even 1·20th, is short enough for the minimum exposure. We have the evidence of Mr. G. F. Williams in our last Year-Book, that 1-10th of a second is generally short enough for ships in motion, and we should therefore consider a shutter which would give an exposure varying from about ¼ to 1-20th of a second to satisfy the conditions required for landscape instantaneous work. One-twentieth of a second is about the shortest time that will fully expose the most rapid plates with the best condition of light, unless a portrait lens be used; and such a lens is very objectionable for landscape work.

The third condition mentioned above is the one which we should most like to see satisfied. What we want is an instrument which we can set to any fraction of a second, and of which we shall know, when it is so set, not only that it is giving an exposure "a little shorter" or "a little longer than the last," but that it is giving one of 1-10th or 1-15th of a second, or whatever the case may be. It should be distinctly understood that there is as much difference between the effects of two exposures, one of which is 1-10th of a second, and the other 1-20th, as between two exposures, one of which is 20 seconds, and the other ten.

As regards the fourth condition, we think that somewhat too much stress has been laid on the necessity of having two moving parts for the mere sake of avoiding vibration. It is evident that a very rapid exposure has been under consideration, and doubtless if an exposure as short as $\frac{1}{50}$ of a second were desired, and if the moving aperture were several inches long, it would be quite impossible to avoid vibration unless there were two equal moving parts, moving in opposite directions; but for a moderate exposure, say of $\frac{1}{20}$ of a second, and with a small lens with a comparatively short aperture, in the shutter we know that a single action instrument may be quite steady enough, and for many purposes such a shutter placed in front of the lens will satisfy all requirements. In a former article, however, we showed the desirability of having the shutter opening and closing at the centre, and almost the only way of bringing this about is to have two moving parts.

We may sum up our remarks on the principles of instantaneous shutters by giving the following as the conditions which those who experiment in the direction of a "perfect shutter" should attempt to fulfil. As we said at the commencement, it may be a physical impossibility to fulfil all of them.

1. The shutter must be able to give a variable exposure.

2. It must be able to give a definitely variable exposure, the minimum being about $\frac{1}{20}$ or $\frac{1}{30}$ of a second.

3. It should work between the combinations, and should open and close at the centre.

4. It must be impossible for it to shake the camera.

5. The openings in the moving parts must be several times as long in the directions of their motion as the diameter of the lens.

6. The instrument should be light and compact.

◆

SILVER PRINTING AND TONING.

Permanent processes have not yet ousted the old method, and there seems but a remote probability of albumenized paper ceasing to be the centre of interest for the bulk of photographic printers, and it therefore becomes an important point to know how to use it to the greatest advantage, and to obtain the most lasting pictures.

In the first place, it is a point of wisdom to use a sensitizing bath of a sufficient strength, and to avoid extraneous additions, such as nitrate of lead. Inexperienced photographers are apt to be misled by the statements of advertisers who vaunt their paper as giving admirable results with a thirty-grain, or even a twenty-five grain bath, but those who put faith in these statements pay for their credulity by repeated failures, while the paper manufacturer suffers in his reputation. Nothing less than a sixty-grain bath can be used with advantage in ordinary cases, and it frequently happens that an eighty or ninety-grain solution is necessary to do justice to certain negatives.

A very important matter is to keep the solution free from accumulations of injurious organic matters, and this end is easily attained by keeping the bath fairly up to its working strength as regards silver, and occasionally agitating with a little kaolin or china clay, care being taken to always filter the liquid before sensitizing the paper.

A short floating on a strong bath may generally be regarded as more satisfactory than the more prolonged action of a weaker solution; but, however short the time of floating may be, it is desirable to lift the paper up at the half-time and to replace it on the solution, as this proceeding serves to obviate the mischief which might otherwise be occasioned by bubbles of air, or other sources of irregular action.

A correct judgment as to the exact extent to which over-printing should be carried, in order to obtain any required tone, can only be acquired by experience and observation; and even these are insufficient, unless care be taken to keep the sensitizing and toning baths in a uniform condition as regards strength.

The advantages resulting from a moderate fuming of the sensitive paper with ammonia appear to be much under-estimated in this country, and we strongly recommend our readers to make comparative experiments with fumed and unfumed paper, and they will find a considerable saving of time as regards exposure and toning to result.

The old-fashioned acetate toning bath is, we believe, the best of all, and by the exercise of care it is possible to obtain any required tint by its use. A form which answers admirably is that recommended by Mr. Payne Jeunings, this being compounded as follows:—

Chloride of gold	1 grain
Acetate of soda	35 grains
Carbonate of soda	5 ,,
Water	8 ounces

More chloride of gold must be added from time to time as the solution becomes exhausted, and it is advantageous, but not essential, to give the solution a rest after the addition of gold, and for this reason it is desirable to have several baths in stock, and to use them alternately.

The importance of a thorough washing of the prints before their introduction into the toning bath is often under-estimated, a final rinse in very weak salt and water being also an advantage. After removal from the toning bath it is well to put the prints into a dish of water and to allow them to remain a few minutes before fixing.

The usual hypo bath of four ounces to a pint serves well for fixing, and the importance of keeping the prints gently moving in both toning and fixing baths cannot be too strongly insisted on.

As regards washing, the matter may be summed up in a few words—plenty of water, constant motion, and frequent changes.

◆

THE PHOTOGRAPHIC EXHIBITION.

[A FOURTH AND LAST VISIT.]

The name of Mr. J. Hubbard is welcome again in the catalogue, and if the "Anxious Mother" (302) does not please so well as some of his former work, it is marked with all that care and deep feeling which have brought Mr. Hubbard's name into notice. The poor cottage with its scanty furniture, the bare walls and slender stock of utensils, are all in keeping; the only fault we find is in the child, which is too plump to give rise to much anxiety. Mr. Owen Bird's open air scenes (301), "Archery," "Lawn Tennis," appear to have been taken in a high wind, which has marred much of the effect. Mr. Earp's only picture (304) is out of sight. Of Messrs. J. Chaffin and Son's collection, "The Signal" (311) is by far the best. It is the finest picture of its kind in the room. A young lady wrapped in a soft shawl of white wool is dropping a rose from the window; the model is charming, the pose full of taste, and the delicate rendering of the white wool beyond praise. Photographers will do well to make a note of this kind of drapery, which is so well adapted to camera work.

Mr. Robert Slingsby sends only one picture, "I Win" (312), a reckless cavalier who has upset his wine cup in the excitement of turning up a trump. It is a forcible study, and well conceived. Mr. Netterville Briggs shows a good portrait of the Prince of Wales (388). Mr. W. N. Malby's most successful contribution is "The Little Ramblers" (317), which has a nice tone, and is harmonious throughout. Messrs. Byrne and Co. exhibit good work in a frame of cabinet pictures (324), and also in a frame of panels (385), in which, however, the dresses are decidedly more conspicuous than their wearers. Messrs. J. Russell and Sons have, among other contributions, four monster frames of photographs of Members of Parliament (337-340), all of which we are told are "out-door" pictures; they are capital portraits, however they were done. A frame, entitled "Isle of Wight Diamonds" (328), being bits of scenery from the island, is sent by Mr. F. Rigge. Mr. Garrett Cocking's scene from "Box and Cox" (329) is well conceived and carried out, but gives the idea of an amateur performance in a room, rather than actors upon a stage. One of Mr. Maxwell's views (330) is too high to be seen, and the other (581) is upon one of the screens, but where we could not discover; we fear from this that Mr. Maxwell could not have sent in his pictures on the day specified. M. Edmund Sacre has some fine prints in Lichtdruck (332-3), one of them, a quay with old-fashioned buildings, being not inferior to a vigorous silver impression. The panel portraits (347) of Messrs. Adams and Stilliard are a little too dark and monotonous to please us. Mr. Arthur Hill is seen at his best in "Canterbury Cathedral" (494), a picture of one of the chapels being exceedingly good; it is an interior such as we rarely see, the little nook being lit up quietly, and yet effectively. "Old Church and Yew Tree" at South Hayling (349) is Mr. John G. Horsey's best contribution, while of those sent by Mr. R. W. Buxton, we prefer "Liverpool Docks" (475).

Mr. W. F. Donkin, whose scenery of the Higher Alps we have already had occasion to praise, exhibits this year some wonderful snow slopes, and also several fine views from the lofty peaks of the Dona, &c. (498, 499, 501, &c.) One of them is taken from a height of 14,940 feet, which proves Mr. Donkin to be an intrepid mountaineer, as well as a most capable photographer. Would anyone learn why Alpine climbers risk life and limb, let him look at Mr. Donkin's bright panorama from the top of the Allalinhorn (496, 497); some idea of the realms of glittering crystals into which the mountaineer penetrates can be obtained here—of the smooth snow cornices gilded by the sun, of the giant peaks that raise their heads on all sides, and urge you to the belief that nothing but mountains exist upon the earth, of virgin snow fields so soft, rounded, and spotless, and so unlike our everyday world. An old dame resting patiently with clasped hands in an open doorway, termed "Waiting" (355), is the most successful of Mr. Shuter's pictures. The portraits of Mr. Wettern (358-360) will puzzle many; the animals are introduced with considerable ingenuity—barring the india-rubber ducks in one of them—but the only question is whether the result is worth the means.

Mr. Adcock's clever and well-lighted interiors (476) are a little marred by the personages, who are so obviously doing nothing while having their portraits taken. Mr. C. J. Hill sends some nice little pictures of the South of France (363). Mr. J. McLanachan's frame of yachts (370) contains several good sketches, one, notably, of a dark crisp sea. Lieut. Gladstone, R.N., of H.M.S. *Vernon*, exhibits several good interiors (374), that of a library being the best lighted and most harmonious. Signor Rossi sends from Milan some pictures of the International Exhibition (376, 379, &c.) held this year in that city.

Two frames of micro-photographs (382-3) are contributed by M. Ardes Goudman, and we are sorry to see they are the only examples of this most interesting branch of the art; the pictures are for the most part clear and sharp, and represent enlargements to the extent of several hundred diameters. Other scientific contributions of more importance still are Prof. Noel Hartley's photographs of Spectra of Elementary Substances, in connection with which he recently wrote a series of interesting articles in these columns. One of the main points of the spectra pictures is to demonstrate how far photographic action extends into the ultra-violet region, and in the pictures of "Copper" and "Tellurium" we find indications of photographic action much farther towards the end of the spectrum than in the prints representing the other elements.

"Another Cherry Ripe" (390), a tiny round-cheeked maiden in mob-cap and mittens, is the most successful study of Mr. H. H. Harding's series, who is an apt disciple of the Faulkner school; Mr. W. Palmer's "Grand Canal," with its rippling water (394), is a fine print, and others in the same frame are little inferior. Mr. W. H. Croydon's "Flying Scud" (397) is a good picture, and skilfully taken, although with her flapping canvas we rather doubt "the twelve miles an hour." Another sea study is the fine panorama of Portsmouth Harbour shown by Messrs. G. West and Son (401), which measures some five feet in length. This is a magnificent production, both pictorially and photographically. The massive white troopship *Serapis* forms the centre of the composition—admirably contrived, by the way—and left and right is the harbour—not a mere sheet of water with listless hulks floating here and there, but with plenty of life like the busy seaport it is. Steamers and tugs are seen at full speed, and conspicuous in the picture is the famous *Victory* and the *Duke of Wellington* three-decker that does duty for flagship. Mr. S. G. Muir is represented by a frame of portrait studies (402) hung too high for proper inspection.

Of Mr. Vernon Heath's fine series of "Old English Homes," we like Holland House the best, of an enlargement of which we have already spoken; but perhaps the most charming bit of photography exhibited by Mr. Heath is the Gateway of Charlton House (411), built by Inigo Jones: the sunshine and shadow on the grey masonry is here exquisitely rendered, and the graceful foliage that veils a portion of the structure adds a further charm to this most delightful photograph. Mr. F. Harrington shows an enlargement of a little girl (427) called "Our Pet."

In the Platinotype corner of the room, Mr. H. B. Berkeley and Mr. W. Nicholson's works are most conspicuous. Being in a photographic exhibition, we suppose Mr. Berkeley's prints are photographs; but they might readily be taken for fine engravings or etchings, so perfect are their harmony and tone, so delicate is their composition. The patch of silver birches and ferns (436), and another picture hard by, representing marsh and fen, are quite triumphs of art. Mr. Nicholson's "Needle Rocks" (455) we like best of his pictures. The Photographic Stores are represented by two bromo-argentic enlargements (451-2).

Mr. F. Piercy exhibits a series of his soft crayon portraits (472), the photographic work, if we mistake not, being printed in platinotype, and are therefore quite permanent. Mr. Griffiths Medley's best picture is "Bonchurch" (478), and of Mr. E. Letellier's we prefer the tug and the vessel in tow (481), which is exceedingly good. Mr. J. H. Ritchie has just missed securing a very fine picture of a hay barge filled high, encountering a stiff breeze in the river (483). Of the two frames sent by Mr. W. Peek, we like the outdoor views best; a "Pier Head," depicted with much vigour and go, finds a place on the screen close by, but whose it is there is no evidence to show. Mr. Edward Dunmore exhibits his excellent moonlight picture (508), of which we have already spoken in these columns; it is the best genuine moonlight production we have ever seen. An ivied bridge, spanning the Conway, we think, is the gem of Mr. J. F. Glossop's Welsh views (510). Mr. R. Passingham shows "An After Dinner Speech" and other sketches (514), the old gentleman with lifted forefinger being an excellent portrait. Mr. F. Beasley, junior, is represented by a view of Sandown (518); Mr. H. Waterhouse Pope's "Old Mill" is an ancient one-storied dwelling canopied with foliage, photographed with much skill, albeit the leaves and branches are a little dark here and there. Mr. C. Reiner's young lady (528), who wants you to play with her, looks a little glum, notwithstanding her kindly invitation, and might have put a better face on the matter. "Richmond Regatta," by Mr. J. Bracebridge Hilditch, is a bright little picture. Mr. Charles R. Lenthall shows some good work in "Interiors" (569) and views (557), and Mr. J. Streatfield Cox exhibits in the "Cheddar Cave" (558) an interior with a vengeance, indeed. Mr. A. J. Langton sends a frame of portraits (560). Mr. W. Trenemen (567) shows some excellent pictures of park and water scenery; and Messrs. J. and G. Turner (573) include, among their views of Ramsgate, a good picture of a cutter rounding the pier-head.

Dr. Morton's two frames of Welsh views (578-9) illustrate worthily the interesting paper that recently appeared in our columns of a tour in Wales made by the Doctor; all his pictures are good, and several of them very good. The valley scene, with a patch of black firs in middle distance, and the soft outline of the Welsh hills beyond, is the most successful of Dr. Morton's series.

Mr. H. M. King shows a large series of transparencies (584, &c.), all pictures of apartments in Windsor Castle, and all of them representing high-class work. Look at the Queen's private sitting room (595) and the private audience chamber (587), in which furniture, drapery, knick-knacks, &c., are all rendered with marvellous detail, while there is not a single inky shadow, even in the remotest corners. We must say a word of praise, too, for Mr. F. York's optical lantern-slides "from life studies," which represent in graphic detail the stories of *Little Nell*, *A Trap to Catch a Sunbeam*, &c. Mr. York's clear bright transparencies are too well known for us to testify to their excellence, but we may, at any rate, congratulate him on the success which has attended his last efforts in the way of pictorial story-telling. A picture of Putney Bridge by Mr. R. W. Goodden (621), a fine photograph taken from an uninteresting point, also finds a place on the table.

Of apparatus there is a goodly show in the room, some of which is catalogued, and some not. Mr. Edwards' balanced head-rest is one of the latter. Mr. James J. Shew shows a changing-box and a storage-box, whose most valuable qualities are lightness and portability. Messrs. Hunter and Sands have a camera fitted with an ingenious shutter, and also a changing-box. Messrs. Fallowfield exhibit also a changing-box, and the famous shutter by means of which the Swan pictures were taken. Messrs. Marsh Brothers show a shutter as well; and Messrs. Marion and Co. exhibit a host of useful articles, of which Warnerke's sensitometer and Cowan's cutting board are not the least important. Messrs. G. Houghton and Sons show a model of Clarke's posing platform, and some specimens of photographic gelatine; and Messrs. Murray and Heath are represented, as usual, by stereoscopes of novel design.

At Home.

DR. J. M. EDER, AT THE IMPERIAL TECHNICAL ACADEMY IN VIENNA.

A massive, square-built pile is the Technical Academy. It is a stone building, erected at the beginning of the present century, and situated in the city itself. There is a statue of Ressel in front, the discoverer of the screw steam-ship, according to Austrian authorities, but there is no pretension to ornament outside or in; the only sense, as you enter, is that of bewilderment, standing in the wide vestibule, and gazing at the multitude of doors that lead to innumerable class rooms. Nobody heeds you; all who like, apparently, are welcome to come in; and, so we afterwards learn, there is actually no fee demanded from those who desire to attend Dr. Eder's lectures on photographic chemistry. We enlist the services of a guide, and pass from one cold passage to another; presently the pungent odour of chemicals is wafted on the air, and in another moment we enter Dr. Eder's laboratory.

We take his portrait as we best can—without camera and gelatine plates. A tall, sprightly figure, sparely built; he wears a slight beard and moustache, quite black, and has dark piercing eyes, that glitter the more, possibly, because of his spectacles. Still young, he has the exuberance of a boy, and the *élan* of a Parisian student. His exhaustive researches, instead of telling on his nature, appear only to have increased his thirst for investigation, and before a quarter of an hour has elapsed, we have rapidly reviewed the most prominent problems of the day, not forgetting the gelatino-chloride process, which has of late taken up so much of his time, and that of his brother-in-law, Captain Pizzighelli.

We ask about his present work; if he is busy just now? Our friend shrugs his shoulders, and glances round the laboratory. Then he looks at us with his arms akimbo, and laughs. There are some half-a-dozen experiments going on in the laboratory at this moment, touching oxalate development, consistency of gelatine, and the treatment of gelatino-chloride. In reference to the latter, Dr. Eder hands us a little sheaf of spectrum photographs, which, as he demonstrates, clearly prove the points he has recently dwelt upon in his controversy with Mr. Berkeley. He has been making these spectroscopic observations throughout the summer; but, unfortunately, has had no better instrument at his disposal than a small Browning (direct vision) spectroscope. This instrument, as a matter of course, absorbs much of the ultra-violet; but the prints nevertheless undoubtedly show that the maximum energy is in the *blue* part of the spectrum, so that in this respect the chloride is similar to the bromide of silver.

"These experiments here," says Dr. Eder, "have reference to the double salt formed by iodide of mercury and hyposulphite of soda, as it occurs in Edwards' intensifier. It is a *new* double-salt, and I want to find out something about it. The Edwards' intensifier is decidedly sensitive to light; in the dark, after a few days, a *yellow* precipitate falls, which, for the most part, consists of sub-iodide of mercury; while in daylight a *dark* precipitate forms, and there is a larger quantity of it. I want to get at the true cause of this," says our energetic chemist.

Dr. Eder moves on to another part of the laboratory. "I am doing something here, as you may see, with iron salts. By the decomposition of ferricyanide of potassium in light (red prussiate of potash), ferro-cyanide is of course formed; but, at the same time, another *blue* product results, which has never yet been properly investigated. So I am goign to try what I can do in the matter."

There are other investigations to which the versatile chemist briefly refers, touching the behaviour of aqueous solutions of chlorine, bromine, and iodine in light in the presence of organic bodies. "These experiments, I am glad to say, I am just finishing," adds the doctor, blithely.

Returning to the Industrial Academy itself, we ask Dr. Eder for information about his lectures. These, it appears, are held during the winter half-year only, and they take place in the evening from five to six, so that photographers, their assistants, and, indeed, anyone who has occupation during the day, can attend. Every Thursday and Friday, at this hour, some thirty students attend in the class-room, where Dr. Eder holds forth, there being, as we have said, no fee to pay so long as certain conditions are complied with.

The audience is a singular one, says the doctor. Some are university students, who attend the course of lectures as a branch of chemistry and physics, and on whose account it is necessary to go systematically into photography in all its scientific bearings; another portion are, on the other hand, practical men and working photographers, who come for technical knowledge, and live in hopes of hearing of some universal formula by which, notwithstanding clumsy development, and blundering manipulation, they may still be able to produce beautiful pictures; finally, there are young assistants, whose principals take care that they shall be well grounded in the theory of their work.

Under these circumstances Dr. Eder has rather a difficult task to perform. He must, perforce, touch upon purely chemical points, as well as those of a thoroughly practical character; otherwise, he naturally enough loses a portion of his audience.

"To do this," continues the doctor, in quick earnest chat, "I change my plan of lecturing year and year about. One season I begin with photo-chemistry—that is to say, I treat of oxidation in light, of chlorine and hydrogen, &c.—and then discuss the silver salts and optics, at the end of my course; the next year I begin my lectures by treating of optics, and then take the salts of silver, &c. But I always lay great stress upon iron, uranium, chlorine, &c., because I find I can teach the essence of photo-chemistry much better through them than through the silver salts." In a word, Dr. Eder considers that the reactions of the above-named elements are more easy of comprehension by the students; and when the lecturer has instilled a knowledge of their behaviour, the rather complicated change that silver salts undergo when acted upon by light, and by developing and fixing solutions, are more readily grasped.

Here are the gelatino-chloride transparencies which were exhibited this spring at Vienna by Dr. Eder and Captain Pizzighelli. They are a magnificent series. All are portraits, and nearly all from one and the same negative—a charming bust picture of a Viennese beauty. They appear more brilliant than carbon transparencies, and by reason of their varied tone they are to be preferred to ordinary silver impressions with collodion or albumen. Of the thirty or more in the series, no two are alike. The darker tones, the doctor tells us, are all produced with ammonio-chloride of silver and citrate of iron, or citrate of iron and gallic acid. These are decidedly the most elegant transparencies, especially when toned with gold, to wit: a bath of chloride of gold, hyposulphite, and sulpho-cyanide of ammonium. The yellow-brown tones and crimson tints, some of which are delightful in their warm glow, are produced with silver chloride alone, or with hydrochinone. By ringing the changes on the developers, the most delightful shades are apparently to be secured, and the series show that Dr. Eder and his clever coadjutor have taken gelatino-chloride out of the domain of experiment and made a practical process of it.* We wish our readers could see the collection of transparencies, and so we say to Dr. Eder. "I should be exceedingly happy to send them to London," he replies, "only it is next to impossible to forward such delicate objects uninjured."

It may be supposed, that with these investigations on hand, that the worthy doctor's time is fully occupied. Not so, however. When test-tube and beaker are out of his hands, he must needs drive a quill, and to some purpose too. No sooner had he finished "Modern Dry Plates," than he began a work of much larger dimensions. His object is to write a complete manual of photography, a work that will fill, according to his present calculation, some 500 to 600 pages. He proposes to make it a history of the art, and to include both the high-ways and bye-ways of photography; that is to say, treat experiments and processes, which so far may have led to no practical results, but of which a record is almost as desirable as the every-day methods in general use. Dr. Eder, in a word, designs to write a book like Hunt's—a comprehensive treatise on photography, which shall be a history as well as a book for the student. Among other illustrations, we hear that Great Britain is to be honoured by having included in the work the portraits of three English discoverers.

The "By-the-Bye" next week will be "On Tripods;" the following "At Home" will be "Messrs. Winter Brothers at Vienna—Photography on Canvas."

A SIMPLE CURTAIN SHUTTER FOR LANDSCAPES, ETC.

BY R. B. GILSON.

This shutter, as represented complete in fig. 2, the writer believes will be found a very useful and effective accessory to the amateur or professional photographer, it having been used with considerable success during a recent holiday tour.

The advantages claimed for it are: the prolonged exposure which can be given to the foreground, combined with smoothness of working, while its capability of being altered to work in the most rapid form, as a shutter, opening and closing at the centre, or with an aperture passing across the lens like the drop shutter, adds to its value. It may be made by the least skilful to fit any camera at the cost of not many pence. Take two pieces of mahogany four inches square, one eighth thick (A, fig. 1); in the centre of that to be used for the front, cut the hole for flange of lens, and in the back cut a hole to correspond, but rather larger, to avoid obstructing the field. Two pieces, half an inch square, five inches long (BB) should now have one inch at the end of each left the full thickness, but the other four inches pared down to one-eighth of an inch thick, so that when the back and front are fastened on these side-pieces they will be separated only by one-eighth of an inch in space.

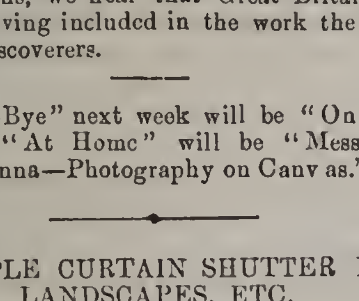


Fig. 1.

Two three-quarter inch screws (CC), with the ends filed to round points, are screwed through the two side-pieces from the outside, as near the top as possible, and with the points exactly opposite each other.

A piece of wire (D) with the ends hollowed out is arranged to run on the points of these screws, and over this roller a strip of leather runs and forms the shutter. The leather screen most useful for general landscape work is shown in figure 2, and it consists of a strip 16 inches long, and barely three inches wide; an aperture two inches wide and eight inches long being made, as shown at E.

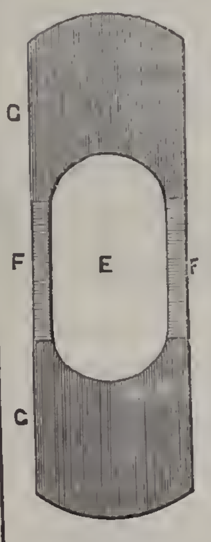


Fig. 2.

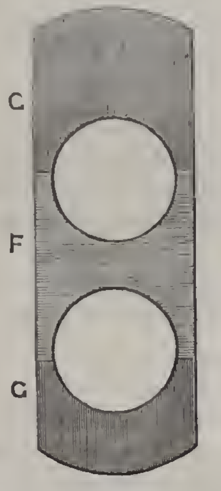


Fig. 3.

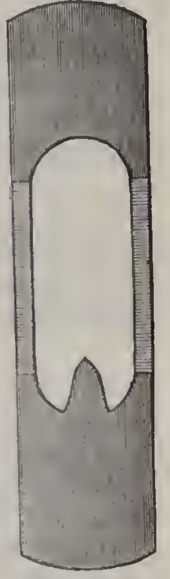


Fig. 4.

The darkly-shaded parts, GG, are stiffened by having two pieces of black paper glued on, while the lightly-shaded portion (FF) of the leather is pared down as thin as possible, that it may be very flexible.

This curtain, now placed in position, will slip over the roller backwards or forwards without the least vibration, while the stiffened parts act as a stop, and only allow the flexible portion to move over. When the ends are level, the lens is open; but when either end is pulled down, it is closed. The exposure is given by simply pulling the highest end down till stopped by stiff portion. To avoid friction, the top and bottom inside edges of the back and front should be levelled off, and also the inside edges of both the holes in the centre.

It will be seen that the exposure begins and ends with the foreground, and thus it will receive considerably longer exposure than the sky, even with a very rapid exposure, while it may be indefinitely lengthened by the slowness with which the curtain is moved. If front of camera will slide in either horizontally or vertically, it can be used across the plate, and will then give a more prolonged exposure to either right or left-hand as desired.

For quickly-moving objects, a curtain cut as fig. 3, used in place of the other, will give a very rapid exposure; opening and closing from centre of lens, and being exactly similar in principle to Messrs. Hunter and Sand's shutter, which works behind the lens. A few strips of leather carried in the pocket would enable a special shaped aperture to be cut to suit any very peculiar object; thus fig. 4 might be used to give rather longer exposure to both sides than to the centre of the foreground. In practice, however, the general landscape shutter will be found to fulfil nearly every requirement.

---

* See Photographic News, p. 470, and previous articles.

Notes.

The Year-Book of Photography and Photographic News Almanac for 1882 will be published on the 20th prox.

We have reason to look forward with especial pleasure to our next publication, and we will tell our readers why. Our last Year-Book was so warmly received that *two thousand* copies more were sold than on any previous occasion. We know very well that its success was due less to ourselves than to our kindly contributors, so it is only natural that we should repeat our invitation of last year; only, as our space gets more and more limited every year, we have to ask all those who kindly send us articles or memoranda to make them as *brief* and *practical* as possible; that our correspondents, moreover, will send us their papers forthwith, is our not less earnest prayer.

The Prince and Princess of Wales brought away souvenirs of the International Electrical Exhibition at Paris in the shape of their own photographs executed by M. Liébert in the Exhibition by the aid of the electric light.

Mr. Robert Bell, of Kelso, sends us a method of hardening gelatine films, which he hopes may be of use to dry plate and carbon workers. "It is simply to add a quantity of chloride of sodium (common salt) to chrome alum, and place the plate in it for a short time; on removal the film is ready to dry at the fire. As the plates, if dried with much moisture in them, are in relief, it is necessary to allow them to drain well before applying heat, or have the surface water removed by some other means."

We like our contemporaries to quote us, but we like them to acknowledge the source of their information as well. Some months ago we conceived the idea of inviting articles on "How I Keep My Books," and we moreover took the trouble of selecting the best and paying for it. Our Russian contemporary, we see, with the unpronounceable name, has *adapted* Mrs. Way's article, but does not say where he got it from.

An event indeed! *Truth* says:—"The bells of Upton Pyne church were rung on Thursday in honour of the sixty-third birthday of the lord of the manor (Sir Stafford Northcote), who celebrated the day by driving into Exeter and having himself photographed."

A French journal—*La Nature*—last month conceived the happy idea of employing micro-photography to illustrate an article on the drinking water of Paris.

Manchester is to have a Photographic Exhibition, and during the present month, too! The Manchester Society hold a *soirée* on the 22nd to inaugurate the Exhibition, which will remain open to the public until the 26th inst. Pictures must be forwarded to the hon. secretary not later than the 19th. The regulations will be found in another column.

The first meeting of the session of the Photographic Society of France will be held on the 11th inst. Our valued correspondent, M. Vidal, promises us a full report of all the subjects of interest which will be discussed there.

From America comes a suggestion to employ photography for tracing a ship's course on the chart. The chart is printed on sensitive paper—or, rather, on several sheets of sensitive paper—one sheet being employed per diem. The sensitive chart sheet is mounted upon a bar magnet, so that the sheet is always kept north and south, and by means of clockwork the magnet and sheet are advanced a certain distance during the twenty-four hours. This distance depends upon the clockwork, and the clockwork is regulated hour by hour, or at such intervals as the speed of the vessel is noted; that is to say, the clockwork, by adjusting the flywheel, may be altered with the speed of the vessel, whether this is going ten, twelve, or fourteen knots an hour as the case may be. A small fixed lens concentrates a pencil of light from a lamp upon the moving sensitive chart, and this then becomes marked with the course of the vessel.

A similar method was described in the French papers not long ago. and referred to in these columns. In this case a sheet of sensitized paper was kept moving in a horizontal direction under the compass, in one part of which a tiny lens was fixed. The light concentrated by the lens marked a line upon the moving paper, which line was more or less curved according as the vessel had been truly steered in its course.

The Photographic Academy at Salzburg, of which we spoke last year at the time of its foundation, has turned out exceedingly successful; it is the only institution in the world devoted entirely to the theoretical and practical teaching of our art in its various branches. Last year there were twenty-seven pupils, and for the present term no less than 37 have entered their names. During the first period of their term the students receive instruction in photographic chemistry by means of lectures and laboratory practice, and then proceed to practical work. A glass room with dark laboratories, a terrace for silver printing, a room for photo-zinc etching, another for collotype—nay, even special rooms in which photo-electrotyping and enamel photography are carried on—are included in this practical establishment.

The pupils at Salzburg at this moment include countrymen from most of the European States, and among them are to be found heads of establishments who have left behind them at home a staff of ten or twenty assistants. But for the most part they are young men who have just left school or completed their term of military service. As some proof of the confidence entertained in the Academy by photographers in general, it may be mentioned that of last year's scholars one young pupil left to take up an appointment in Frankfort worth 3,000 marks (£150) per annum, and another accepted an appointment in Paris of the value of 2,500 francs.

Topics of the Day.

M. GARNIER'S NEW METHODS OF PHOTO-ENGRAVING.

BY MAJOR J. WATERHOUSE, B.S.C.

In one of the upper rooms of the Electrical Exhibition in Paris, there is an interesting collection of plates and proofs produced by various methods of photo-engraving, invented by M. Henri Garnier, whose name is so well known in connection with these processes, and whose beautiful plate of the Chateau of Maintenon gained for him a gold medal at the Paris International Exhibition of 1867.

Some interesting details of these processes are given in an extract from a report on them by M. Davanne to the Société d'Encouragement pour l'Industrie Nationale, read at its sitting on the 22nd July last, of which copies are distributed gratis in the Exhibition.

The report opens with a brief allusion to M. Garnier's continuous labours in permanent photographic printing, commencing with the ingenious mercury process worked out in conjunction with M. Salmon, and published in 1855, in which a print which has been exposed to the fumes of iodine is laid down on a plate of polished brass, so that the iodine, absorbed by the printed lines, slightly attacks the brass; mercury being then rubbed over the brass, forms an amalgam with the iodised parts. If a roller charged with printing ink be now passed over the plate, the ink will only be taken on the pure brass, and not on the iodized parts. The plate is next bitten with acid nitrate of silver, and may then be treated in various ways, so as to form either a printing-block or an engraved plate. The process never came to any practical use, but led M. Garnier to the invention of the very valuable and largely-used process of acierage or steel-facing, by which the surface of engraved copper-plates is so hardened and protected by a thin coating of iron that, instead of only a few hundred impressions, many thousands can be printed from a plate without the slightest deterioration.

The next invention noticed is the citrate of iron process of MM. Salmon and Garnier, in which a paper, coated with a syrupy solution of citrate of iron, is exposed to light under a positive print for a period varying from eight to ten minutes in the sun, to half or three-quarters of an hour in the shade. In the parts where the light has acted the paper becomes non-hygroscopic in proportion to the intensity of the action of the light upon it. The paper being left for a short time to absorb moisture from the air, is dusted over with lamp-black, which, attaching itself to the unexposed parts, reproduces an exact image of the original drawing.

M. Garnier has since greatly modified this method of obtaining an image by dusting, and applied it to various processes of photo-engraving.

The report then proceeds to give the following details of a process of photo-engraving, which was exhibited before the Society by M. Garnier in March last:—

Photogravure.—In photo-engraving a distinction must always be made between the reproduction of drawings in line and those with shaded tints.

A.—*Photo-engraving of Line-work.*—A plate of copper is prepared by covering it, either by flowing or with a roller, with a very thin coating of a solution of:—

Sugar	2	grammes
Bichromate of ammonia ...	1	„
Water	14	„

This coating is equalised and quickly dried by means of an arrangement which keeps it in rotation over a warm plate.

As soon as the plate is dry, a positive cliché of the drawing to be reproduced is laid upon it, and the whole exposed to the sun for a minute, or to the electric light for three minutes. The reaction produced is the same as with the citrate of iron, but much quicker; the exposed parts are no longer hygroscopic, but in the parts protected by the lines of the drawing the sensitive coating has retained its stickiness, and will hold any powder that may be passed over it, thus producing a very clear image of the drawing. The coating being excessively thin, the little moisture it holds and the powder applied suffice to break its continuity, especially if the powder be slightly alkaline. If the rest of the surface were sufficiently resisting, the plate might be bitten at once; but light alone is not enough to produce complete impermeability: the action of heat must be combined with it. The plate is therefore placed on a grating, with wide openings, a large flame is applied underneath, and it is heated till the borders where the copper is bare show iridescent colours. The sugary coating thus becomes very hard in the exposed parts, but under the powder it is broken, porous, and permeable to acids. The surface is then covered with the biting fluid, which is a solution of perchloride of iron at 45° Beaumé, and after a few minutes' contact the plate is engraved. It only remains to clear off the bichromated sugary coating which forms the reserve, and which, being hardened by the heat, resists ordinary washing. It is removed perfectly by rubbing the surface with a hard brush and warm potash lye; the plate is then ready for printing. Sometimes it may be necessary to give several successive bitings, or to use a resinous grain; in such cases the various methods of the engraver's art are employed.

B.—*Photo-Engraving for Half-Tones.*—To reproduce by engraving the image of any object, a portrait, or a landscape, the gradation of tint is obtained by repeating three times in the following manner the operation A just described:—

The copper plate being prepared as before, it is exposed to the light under a positive, and given a long exposure, say, four minutes in the electric light. The sugary coating hardens under the whites and the lighter shades—it only remains tacky under the blacks. The positive cliché is removed, the plate powdered, and bitten; the blacks alone come out.

The plate is cleaned, then coated again with the sugary preparation, and exposed a second time under the positive, care being taken to preserve an accurate register, which may easily be done. The second exposure is not so long as the first—say two minutes, and gives the image of the middle tints and blacks. The plate is powdered and bitten as before, bringing out the middle tints, and, at the same time, giving greater depth to the shadows.

In the third operation, the plate is exposed still less to the light—say one minute. The high-lights alone harden; the light shades, middle tints, and the shadows remain permeable. After powdering and biting, the plate is finished.

When necessary, after each operation, a resinous grain may be applied in the manner usual with engravers.

It is important to note that M. Garnier affirms that in both cases the engravings are untouched, and that this is one of the essential characteristics of his process.

C.—*Engraving in Relief for Letter-Press.*—In the case of drawings in lines to be made into printing-blocks for letter-press printing, the operation is conducted in its first phase absolutely in the same manner as the foregoing, only, after exposure, instead of producing the image with a slightly alkaline powder, powdered bitumen is used, and the plate is slightly warmed, so that the powder may slightly fuse, and adhere to the metal, but not enough to make the bichromated sugar become insoluble. The plate is then washed with water, and all the sugary coating removed, leaving the surface of the copper bare, except where it is protected by the bitumen forming the image. The plate is then bitten with perchloride of iron, which gives a first biting, leaving all the lines in relief. Further depth is obtained by alternate inkings and bitings, as in the Gillotype method.

The above processes are very interesting; the use of the sugary coating, the hardening it by heat, and the triple exposure and biting are new—at any rate, have not, so far as I know, been published before.

The report then goes on to describe a further application of the same principle to obtaining photographic images recently invented by M. Garnier, and called by him—atmographié.

Photographic Printing by Vapour.—Atmography.—This process consists in tracing or transferring by means of vapours or fumes an image of any object from one surface to another, whence the name of atmography it is proposed to give it. The operations are as follows:—

When an image formed of a powdery substance has been obtained either by dusting (as described above), or by filling an engraved plate with the powder, the plate bearing the image is exposed to a vapour, which has no effect upon it. The powder alone absorbs the vapour, and if the plate be then applied to a surface coated with some substance capable of being acted upon by the vapour, an image is obtained upon this second surface. For example, the lines of an engraved copper-plate are filled with powdered albumen. On the other hand, a few drops of hydrofluoric acid are spread over a wooden board, and the powdered engraving is exposed for ten to fifteen seconds to the fumes disengaged by holding it about a quarter-of-an-inch above the board. The acid is absorbed by the powdered albumen without attacking the copper. If this plate be now placed in close contact with any surface (metal, paper, or glass) which has been covered with a coating of sugar and borax, and dried immediately, a deliquescent fluoborate of soda is produced under the action of the acid vapours, the sugar becomes tacky, and, by brushing a powder over this surface, the image appears immediately.

In M. Davanne's opinion this new invention of M. Garnier's seems likely to have a useful and extended application. The image may be made with powder of any desired colour. If it is on glass, it may be transferred to paper or other support by means of collodion or gelatine. By employing enamel powders, this process gives a new method of producing vitrified images. It may also be used as a simple method of reproducing engravings under certain circumstances; copies of diagrams, however intricate, could easily be produced on glass by it, and used for the illustration of lectures by means of the magic lantern.

Specimens of this process appear to have been exhibited by M. Garnier at the Paris International Exhibition in 1878, and, though I do not recognise the name of atmography, I remember noticing some reproductions by a "new" process of M. Garnier's, which I thought remarkably good.

The "Topic" for next week will be, "Electric Light for Photographic Use," by Walter B. Woodbury.

ON ENLARGING VIEW NEGATIVES WITH A HOME-MADE APPARATUS.

BY H. J. PALMER, M.A.[*]

The production, commercially, of gelatino-bromide paper, has placed within the easy reach of amateurs a new and interesting photographic employment for winter evenings, and, with the ordinary lantern, we have been able to derive both pleasure and profit from the enlargement of our portrait negatives. But, for the most part, we have done, I think, but little, so far, towards the application of Morgan's paper process to the production of landscapes of any considerable size; and the reasons for this apparent neglect of a most interesting and instructive department of photographic work are not, I think, far to seek.

In the first place there is a widely-prevalent prejudice against the enlargement of landscape negatives. The usual advice is to make negatives of the very best character, and as large as you please, of the scenes through which you travel, to print them then, tone and fix the results satisfactorily, and finally to be content with your labour. In the next place, an enlarging apparatus, suitable for use at the time when alone most of us have leisure as amateurs, viz., in the evening, is a matter of too great cost and trouble to be commonly possessed and used.

My object in introducing this subject this evening is to endeavour to do something which may tend to clear away these two main hindrances to the more general practice of a branch of photography which, quite as much as any other with which I am familiar, abundantly repays the workman for the toil and trouble he bestows upon his work.

Now, with regard to the oft-repeated argument on the futility of taking small negatives of views for future enlargement, I am not without hope that I may show you, as the result of to-night's experiment, that this is nothing less than a photographic heresy. An enlarged landscape, when properly managed and produced, is, I think, both from the artistic and the photographic standpoint, "a thing of beauty," which, thanks to the stability of the Morgan process, I verily believe may be "a joy for ever;" or, at all events, for as long as we require to possess it. Again: facilities for the harmonious blending of a dense background with an under-exposed foreground (as in the case of this negative of my old friend, "the Matterhorn"), are very ready to hand and use. When I throw the image upon the sensitive paper I have only to take a piece of board, with its upper edge cut in the direction of the outline of the upper edge of the nearer range of hills; to place this at the distance of about two inches from the sensitive sheet on the screen; to move it slightly while I expose the dense background of the subject for (say) five minutes; then to give three minutes more to the whole picture, and I obtain a satisfactory result. And then, too, here is something advantageous to be done with our thin negatives, provided they possess detail and are free from fog. A picture which is almost useless for ordinary printing will often give good results as the basis of an enlargement.

I usually find that my photographic friends who deprecate enlargement of views are the very men who do most of their work at home, or in their own immediate neighbourhood. They do not, therefore, quite appreciate the exceeding advantage to a traveller through many lands of carrying with him a pocket quarter-plate lens, camera and stand, and a few dozen of these small prepared plates in his portmanteau. Compare the lot of such an one on a tramp over an Alpine pass, with his small satchel and dozen plates in their dark slides on his back, and his alpenstock stand in hand, with that of his companion who scorns enlargements, and must needs carry his whole-plate apparatus and paraphernalia on the backs of several porters; see it roughly handled at times by ignorant peasants, who will not heed, or cannot understand expostulation, and hear it drop with an ominous crash occasionally so as to be broken and useless at the moment of need.

On one occasion, during a walk of eight miles through the Val d'Anniviers, between Vessoie and Zinal, I fortunately carried my pocket camera and its appurtenances without difficulty myself; but my porter dropped the 9 by 7 apparatus three times from his shoulder to the ground, and on arrival I found no focussing glass, all my large plates broken save two, and the camera terribly and almost hopelessly shattered. It was on that occasion that I became converted to the theory that only small plates should be taken from home, and that these should be exposed and developed with the special view to future enlargement, in the winter evenings. Till now, however, I have never got beyond the theory. There were so many difficulties in the way of the practice.

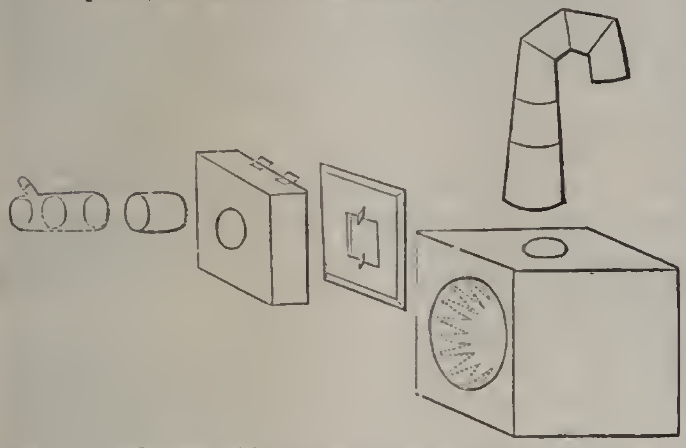
First of all, the lens. I have been told again and again that any good quarter-plate lens would answer my purpose; but I have never succeeded in finding one which gave good definition to the edges without so much stopping down as to render it useless for the purpose. But the new rapid paper puts another aspect upon the whole business, and we may stop our lenses down, and so get sharpness to our heart's content, without prolonging the exposure unduly. The lens I am using to-night is the new combination by Dallmeyer, made expressly for use in the lantern. I am employing a wide stop, for the reason that I do not wish to occupy your time needlessly; but you will see that it gives fairly good definition up to the edges.

The next difficulty in the way of the enlargement of quarter-plate negatives arises from the fact that the sciopticon and other lanterns have condensers too small in diameter to give more than the centre of a view. These obstacles are overcome in the apparatus I am exhibiting to-night. I shall not apologise for the roughness of the apparatus before you. No attempt has been made to conceal the clumsiness of its workmanship, for the very reason that you may see that an effective apparatus does not depend for its usefulness upon skilful and careful make.

---

[*] Read before the Liverpool Amateur Photographic Association.

In the first place, here is an unmistakable biscuit box, placed on its side, with an aperture in the upper side for the smoke chimney of a common paraffin lamp. I have cut from the centre of the bottom of the box a number of slits to the circumference of a circle. The triangular pieces so cut have been bent inwards as to their points, and thus a circular opening has been made to receive the condensers, which are supported on the triangular pieces tied together with wire. The condensers should be five inches in diameter (mine are four and three-quarter inches, and are not large enough) for enlargements from a quarter-plate.



I have mounted this pair at home thus :—Two circular pieces of half-inch deal were cut with the fret saw, and in each of these a round aperture was made with this tool, on one side of the wood, of the same diameter as that of the condenser, and on the other side somewhat smaller. These flat wooden rings hold the condensers firmly, two small pieces of wood or metal being screwed on to the upper surface of each, to prevent the condensers from slipping from their places. The two plano-convex condensers were then placed in position, their convex sides all but touching, and a strip of thick millboard was nailed to each deal ring, so as to form a strong and steady tube. The condensers being in position, a wooden cocoa-box, three inches in depth, was sawn down to the size of a biscuit tin, and its side and end replaced. The lid had an aperture made in it with the fret saw to hold a quarter-plate negative, at the top and bottom of which metal holders are fixed. It was then fastened to the tin biscuit box in front of the condensers by means of screws. I have placed small hinges on the upper edge of this lid, and upon these hinges hangs the cocoa-box, three inches deep. I have not found it necessary to place any fastening on the lower portion of the box, because it closes, and remains closed, of its own accord.

I have cut a circular opening, opposite to the condensers, for the lens, and have made two tubes of millboard, each two inches long, the one sliding inside the other, for focussing purposes. These were constructed in the same way as the condensers, by sawing a couple of circular rings out of half-inch deal—the one about a-quarter of an inch wider in diameter than the other. The larger one is screwed on to the cocoa-box, and then a strip of millboard has been tacked round to form the outer tube. The other ring has a similar tube tacked upon it, and carries the flange of the lens. This, I think, completes the apparatus.

The whole has been constructed with the view of enlarging a quarter-plate negative up to the size of a whole sheet of Morgan's paper, and the common paraffin lamp, with an inch-and-a-half-wick, gives ample light for the purpose. I fasten the paper upon a drawing board, by means of drawing-pins, and place it at a distance of three feet four inches from the lens.

The negative we are using to-night is of even character, and we need not, therefore, mask any portion of it during the exposure. Having focussed carefully through a sheet of yellow glass, I hold in my left hand a piece of cardboard with an aperture of the required size, and place this about three inches from the lens, giving it a slight movement that the edges of the vignette which it produces may be soft and graduated; then, with the right hand, I remove the yellow glass and commence the exposure. This will, of course, vary with the density of the negative, and the quality and amount of the light from the lamp. It may be readily ascertained by exposing a preliminary slip of the paper in sections of a minute each. We shall require five minutes for our work this evening.

I recommend, for development, deal trays covered with two or three coats of varnish. Pour a pint of water into the tray, and place the paper upon the surface of the water. It will now become flat, and, after a few tilts of the tray, the whole surface is thoroughly wetted and ready for the developer. I next pour into a beaker two ounces of a saturated solution of protosulphate of iron, and add six ounces of saturated oxalate of potash, and one drachm of a ten-grain solution of bromide of potassium. The picture soon makes its appearance, and, when sufficiently developed, is well washed, fixed with hyposulphite, thoroughly washed again, and dried, and may be mounted and framed at pleasure.

I do not apologise for the minuteness of all these details, for I wished, if possible, to produce a thoroughly practical discussion this evening, and I trust that I have, in a measure, succeeded.

PHOTOGRAPHIC EXHIBITION AT MANCHESTER.

The Manchester Photographic Society having decided to hold a *soirée* on November 22nd, and an exhibition of photographs and apparatus connected with the art on November the 23rd, 24th, 25th, and 26th, the Council are desirous of making this exhibition a thorough success, and solicit assistance.

Those willing to assist are requested to announce to the hon. secretary their intention of contributing.

Carriage to and fro will be paid by the Society *on all* photographs, &c., received for exhibition not later than November 19th.

Every care will be taken in unpacking and re-packing, but the Society cannot be responsible for any damage in transit.

Packages to be addressed to Hon. Sec. Photographic Society (W. J. Chadwick, Esq.), Mechanics' Institution, Manchester.

Correspondence.

THE PROPOSED PHOTOGRAPHIC SOCIETY FOR CARDIFF.

Dear Sir,—I shall be glad if you will allow me to enquire, through the columns of the News, what steps, if any, have been taken by "J. J. M." and Mr. W. H. Kitchen towards the formation of the above Society? I would also suggest that, to add to the interest and success of the Society, it be *not* restricted to *amateurs* only, but be equally open to professionals. I am well aware that amateurs, as a rule, are unfavourable to professionals being admitted to the management of societies, being under the impression that amateurs are looked down upon by professionals; but it is needless to say that such is not the case.—Yours truly,

Thomas Forrest.

SUGGESTION FOR A DRYING-BOX.

Sir,—In your recent very welcome "Seasonable Hints to Emulsion Workers," you rightly remark that "the real difficulty in making satisfactory and clean dry plates begins when the emulsion has been made." I have long been of opinion that a perfect drying-apparatus has still to be contrived. If the plates are left to dry spontaneously, it is often thirty-six hours, or even more, before the last obstinate wet patch disappears. During all this time the plates are liable to be covered with the dust which is present in the cleanest room, and opaque spots in the finished negative are the result. The many drying-boxes which have been planned and described in your columns possess one disadvantage in the requirement of a flame from which not only light can steal, but from which there is chance of danger from fire. These difficulties have led me to devise a plan whereby a steady heat and draught may be maintained without actual fire or flame. The solution of the problem is found in a solution not unknown to photographers, namely, one of acetate of soda. It is well known that the admixture of certain salts with ordinary water raises the boiling point of the liquid far above the stereotyped 212°. Acetate of soda stands, I believe, at the head of the list in raising the boiling point to 256°.

My suggestion is, that at the bottom of the drying-box (which should be pierced with holes for the admission of air) should stand, on four short feet, a metallic vessel filled with a boiling solution of the soda. This hot box would cause a constant draught of warm air to rise to the plates standing in racks above it, and the retained heat would dry the thickest film in a few hours. This method of heating has already been applied in France to railway foot-warmers, and the following experiment recently tried with one of them will show how such a vessel is capable of holding heat for a long period. A foot-warmer, on being charged with its hot solution, registered 253°. At the end of some hours, when again tested with a thermometer, it registered 211°, or only one below the boiling point of water. I see that a Dresden chemist has lately constructed a stove on the same principle; but the mixture he uses (for which an improvement is claimed) is one part of acetate to ten of hyposulphite. This stove is said to act well.

I must apologise for the crude form in which my suggestion is offered, and I trust that those who have time to experiment in this direction will publish, for the benefit of others, the results obtained. T. C. Hepworth.

BURNISHING AND ROLLING PRINTS.

Sir,—Seeing a letter in your last issue from Mr. Gray respecting his failures with the burnisher, I beg through your columns to offer Mr. Gray and your readers in general a few hints thereon. In the first place, it should not be too hot, as this is a common cause of the print suddenly stopping in the centre of the burnisher, making a mark across the print which cannot be effaced; another failure is the print being too dry, or not dry enough. It should be slightly moist to obtain the desired surface. As the burnisher gets warm, the plate and roller should be carefully wiped clear of all moisture. Some persons use Castile soap dissolved in spirit as a lubricator; but I find that good curd soap is the best, the soap to be rubbed evenly all over the print with a piece of flannel, care being taken that the edges do not escape. Very little soap is required, one rub being enough for three or four prints. If too much is used, it will leave a foggy and uneven surface; unless the print is soaped evenly it is sure to twist or scratch. If the plate should scratch, it should be taken out and well cleaned with fine emery cloth pasted on a piece of round wood. I find it best to pass the print right through the burnisher two or three times till the desired surface is obtained. I have used both Weston's and Entrekin's, and find them all to be desired. A hot press, while giving a good surface, does not give such good results as the burnisher. In conclusion, if you, Mr. Editor, think that these few hints will be of any service to Mr. Gray, or your many readers, I shall feel amply repaid.—I remain, yours, &c., Wintonion.

Sir,—Your correspondent Mr. Gray wished for some information on "Burnishers and Rolling Machines" for glazing cartes, &c. As far as my experience goes, the burnisher is far superior to the rolling machine. I speculated some years ago in a Weston's burnisher, and although it has been in constant use for that times, it is in as good order as ever. The difficulty I had to cope with in the first instance is now completely overcome by the following simple means. I light the Bunsen burner a few minutes before required for use: then take the burnishing part out, rub it with a piece of fine emery paper, which entirely cleans it from dirt and rust; wipe the roller above, and then replace the burnisher. Secondly, get one pound of curd soap and a piece of flannel, rub the flannel on the soap dry, and then apply the flannel to the surface of the card; the soap will last for years, and no fear of any scratching or sticking. Enclosed you will find an enamelled card burnished as above.—I am, sir, yours obediently,

F. W. Broadhead.

[Mr. Broadhead sends two exquisitely finished pictures, which conclusively prove that his method of obviating adhesion or scratching is perfectly successful.—Ed. P.N.]

Dear Sir,—As I have had all the trouble spoken of by Mr. Gray with my burnisher, and have none now, with your permission I will say how I got over the annoyance caused by scratching and sticking. Take out the burnisher from its place under the roller, and with a piece of emery cloth (ask for the finest sort when buying) give it a good rubbing, which will polish it. Now, instead of replacing it, put it on the top of the roller, one end resting on that part that secures it when in its proper place, and light your gas or lamp. Doing this allows the whole machine to have its sweat, and dry up. When dry, put the burnishing part in its proper place, allow it to get sufficiently hot, and then proceed to burnish. If you have scratches now, you must take out the polished bar, and give it another rub. That is all I ever have to do, and I get no scratches. Scratches do not always result through want of polish—often through dust particles getting on the bar while putting it in its place.

Sticking, by which I understand the card refusing to go through, is, in my experience, easily avoided, thus—give the roller a good rough filing—not so rough as to spoil the back of the card, of course, but fairly rough to the touch. This filing will need to be done occasionally, as the roller soon gets smooth.

A rag rubbed on a cake of Castile soap, and then rubbed over the photograph, is my plan of giving the wherewithal to get the glaze; it is very easy to use too much soap—a little is best. As to the heat needed, that is soon found out by practice. The scratching and sticking can be avoided in the way I have explained.—I am, dear sir, your obedient servant, Alexander Buley.

Sir,—There are many different makes of burnishers, expensive and cheap ones, but my experience tells me that the former are the cheapest in the end.

The main points are to keep the burnisher free from dust (the cause of scratches); clean the roller and plate carefully; and remove any possible scratch by going over the plate lengthways with fine emery cloth. While cleaning the plate, light the spirit lamp to warm the roller so as to dispel the moisture, otherwise the cards will stick. Then well heat the plate, and clean with a soft leather, and all is ready for burnishing.

In spotting the cards, I use the ordinary retouching colour mixed with dry albumen, which prevents the removal of the spotting. Spot very carefully, as this retouching darkens considerably.

To obtain a good enamel, I rub the prints with a soft broad brush which has been previously rubbed on a piece of good white soap. The advantage of using dry soap is that the same amount of gloss is always obtained quickly, no matter how long the interval between applying the soap and burnishing, though after an interval of fifteen to twenty minutes I have had to burnish four or five times, instead of twice, before the necessary gloss was reached.

I never burnish a print more than twice, and I obtain all that can be desired. Blisters sometimes occur through overheating the burnisher, or through careless mounting. Prints mounted on plain cardboad always burnish well.

To summarize:—Have the roller warm, or the cards will stick. Have the burnisher well cleaned, free from scratches, thoroughly and equally heated. A spirit lamp with two or more burners is recommended. Dust each card well before burnishing; if neglected, scratches are inevitable.—Yours truly, Jean Gunther.

THE PROPOSED PHOTOGRAPHIC EXHIBITION AT THE SOCIETY OF ARTS.

Sir,—It is to be hoped that all those who are interested in the real progress of photography will co-operate with the Secretary of the Society of Arts in his endeavours to gather together such a collection of objects of photographic interest as shall fairly represent the past and present of this most attractive branch of applied science; and it gives me much gratification to think that some permanent resting place for the relics of the past may at last be found.

I would suggest that some arrangement should be made by which the photographic public can be admitted without payment or tickets on at least one day in each week; and, in view of the requirements of the numerous photographic assistants who are busy while the daylight lasts, I would suggest that the collection should remain on view during the evenings of one or two days per week.

South London.

BALLOON PHOTOGRAPHY.

Dear Sir,—I am desired by the Council of the Balloon Society of Great Britain to inform you that they have arranged with Mr. Woodbury to read a paper on the above subject; and also to state that I shall be happy to forward tickets to any of your readers who may desire to be present and take part in the discussion on Nov. 11th (Friday), at the Lecture Room, Royal Aquarium, Westminster, at 7·30 p.m.—Faithfully yours, A. Standing, Hon. Sec.

32, *Castle Street, Liverpool.*

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The monthly meeting of this Society was held on Thursday, the 27th ult., at the Free Library, William Brown Street, Mr. W. H. Kirkby, President, in the chair.

The minutes of the September meeting having been read and confirmed, Messrs. J. Pelham and W. Stokes were elected members of the Society.

The Hon. Secretary read letters from Mr. W. Atkins and from Mr. Abel Lewis.

Mr. Atkins, in his letter, drew the attention of members to the course of lectures on photography, now being delivered by Mr. E. Banks, at Philadelphia Chambers, Hackin's Hey. He (Mr. Atkins) remarked that, although he had had some twenty years' experience as an amateur, he had derived so much instruction and information from his attendance upon these classes he thought it desirable that the Secretary should issue a circular letter to the members of the Liverpool Amateur Photographic Association pointing out to them the advantages to be gained by joining the classes.

The Secretary, after some little discussion, said he had thought Mr. Atkins' suggestion a good one; but had not felt in a position to issue a circular to the members without the authorisation of the Society, lest he should appear thereby to hint that the photographic knowledge and practice of some of their friends was in a more defective state than was probably the case.

The Chairman exhibited a photograph in which some portions of the picture had become curiously reversed, and thus appeared upon the print as a negative. He also showed a clever instantaneous picture, taken during the past week, in which a cow was depicted in the act of scratching her head.

Mr. B. Boothroyd exhibited and described Watson's instantaneous exposer.

The Chairman thought it would interest those members present, who had not paid their subscriptions for the current year, to know that the Hon. Treasurer, Mr. Twigge, was in the room, and would be pleased to give them a brief interview.

The Secretary laid upon the table several numbers of the New York *Photographic Times*, which had been kindly sent to the Society by Mr. J. T. Taylor.

The Rev. T. B. Banner proposed, and the Chairman seconded, a vote of thanks to Mr. Taylor for the donation.

Mr. E. Roberts announced, amidst many expressions of regret, the death (which had occurred during the present week) of one of the oldest and most respected members of the Association, —Mr. A. Cooke.

Mr. Bean exhibited a new portable quarter-plate camera, by Knott.

Mr. J. H. T. Ellerbeck gave a demonstration of the mode of development of Professor Stebbing's new gelatine films. The process was watched with the greatest interest by the members present, and resulted in an entire success.

The Rev. H. J. Palmer (Hon. Secretary) read a paper "On Enlarging View Negatives with a Home-made Apparatus" (see page 524).

In answer to a question, Mr. Palmer said that the lens employed was one of Dallmeyer's new lantern combinations.

The Chairman reminded Mr. Palmer that Mr. Dallmeyer had stated that this particular lens could not be used for photographic purposes, since the chemical and optical foci were not identical, and asked if he (Mr. Palmer) had experienced any difficulty on this account.

The Rev. H. J. Palmer said that he had, in spite of Mr. Dallmeyer's warning, been using this lens continually for many months for photographic purposes, and that some of the best pictures he had ever taken, or would wish to see, were taken with it.

After some discussion on the subject of the paper, and having answered questions on the apparatus exhibited, put to him by members, Mr. Palmer made an enlargement from a quarter-plate negative on a whole sheet of Morgan's paper. In development, the exposure proved to have been somewhat short, but the result showed conclusively the efficiency of the apparatus upon which the remarks of the paper were based.

Mr. Knott exhibited Marion's portable camera, lens, and stand, and also a convenient non-actinic lamp.

Mr. A. W. Beer proposed, and Mr. Ellerbeck seconded, a resolution that there should be a lantern exhibition at the next meeting of the Society, to which ladies and friends of the members should be invited.

The proposal was carried *nem. con.* The Secretary, however, wished to remind the members that the November meeting is the annual meeting of the Association, and that he fears that, in consequence of the stress of business to be got through on that evening, it will not be possible to give the exhibition then.

The Chairman called the attention of the members to the fact that the competition pictures on the following subjects—"Still Life," "Foliage," "Tired," "Seascape," "Interior," "Cloud Study," and "Spring" should be sent in, mounted, not later than 6.30 p.m. on Thursday, the 24th inst., addressed to the Secretary, Liverpool Amateur Photographic Association, Free Library, Liverpool.

The meeting, which was very well attended, was then adjourned till the 24th instant.

Thursday Evenings for Photographers.

At the meeting held on the 27th inst., the chair was occupied by Mr. J. Simmons, C.E.

Mr. W. M. Ayres exhibited a rack for washing and drying plates, constructed on a similar principle to one exhibited by Mr. A. H. Haddon at a previous meeting; it was made of wood, and was triangular in form, the two uprights forming the basis of the triangle having grooves cut in them to receive the plates. After the plates had been placed in the rack, a piece of wood having notches cut in it is fastened on at the apex, and thus all the plates are securely locked in, and can be washed and stood on end to dry without any danger of their falling from the rack.

Mr. Cobb asked Mr Haddon if he considered the product obtained by first flooding a negative with a solution of bichloride of mercury, and then fixing with a solution of Schlippe's salt, to be permanent?"

Mr. Haddon said he did not think it was.

Mr. Debenham thought that the result was more permanent when Schlippe's salts were used, than that obtained with the iodide formula.

Mr. Henderson said a great advantage in using Schlippe's salt after bichloride of mercury was, that local intensity could be readily obtained; but he thought that negatives intensified with bichloride of mercury alone would be permanent, and in support of this theory, he promised to show at the next meeting some alabastrine portraits taken over twenty years ago.

Mr. Henderson said he had used chloride of sulphur as an intensifier; he found that it intensified readily, but a precipitate of sulphur was deposited all over the plate, thus rendering the negative useless.

The Chairman showed a print from a negative (which he promised to exhibit at the next meeting) of a view in Wiltshire, taken from his parakite; and he explained that the negatives exhibited by him at the last meeting were taken with the same apparatus on Clapham Common.

Mr. Henderson exhibited a piece of silver wire twill suitable for filtering emulsions, which had been sent him from Paris, and which he said was much finer than any gauze he could obtain in England, and he promised to write to Paris for particulars as to cost, &c.

Mr. **Henderson** announced that at the meeting on Thursday, November 10, he will demonstrate two new methods of emulsifying without the use of gelatine.

◆

Talk in the Studio.

Photographic Society of Great Britain.—The first ordinary general meeting of this Society for the ensuing session will take place on Tuesday next, November 8th, at eight o'clock, at the Gallery (Exhibition Room), 5, Pall Mall, East; when the medals will be presented, and the usual business transacted.

Henderson's Trimming Guage.—This piece of apparatus, which was exhibited at Ashley's Hotel on the 21st instant, consists of a piece of stout glass having parallel lines about ¼-inch apart, ruled across it in two directions, at right angles to each other. The print is placed under the guage, and two sides are cut; it is then reversed, and the remaining two sides are cut in the same manner. Mr. Haddon suggested that "Sabatier's ink" should be used instead of the diamond for marking the lines.

Annual Dinner of the Photographic Club.—The second annual dinner of the Photographic Club will take place at Ashley's Hotel, Covent Garden, on Wednesday, November 16, at 7 o'clock precisely. Tickets, 5s. each, can be obtained of Mr. C. G. Cutchey, Hon. Sec., 62, Gracechurch Street.

Photographers' Benevolent Association.—On November the 11th, the Photographic Exhibition in Pall Mall will be open from 7 to 10 p.m., for the benefit of the Photographers' Benevolent Association. The admission will be the same as usual (sixpence); and since the proceeds go to the funds of the Association, it is to be hoped there will be a numerous gathering.

Cantor Lectures.—The following are the subjects of the courses of the Society of Arts Cantor Lectures for the Session just about to commence:—First course, on "Some of the Industrial Uses of the Calcium Compounds," by Thomas Bolas, F.C.S. Second course, on "Recent Advances in Photography," by Captain Abney, R.E., F.R.S. Third course, on "Hydraulic Machinery," by Prof. John Perry. Fourth course, on "Book Illustration, Old and New," by James Comyns Carr. In connection with Captain Abney's lectures, it is intended to arrange for an exhibition of photographic apparatus, processes, &c. These lectures originated in 1863, with a bequest to the Society of Arts by the late Dr. Cantor. Since that date, three or more courses have been given every session, each course dealing with some application of Science to Industry or Manufactures.

Sensitive Gelatine Films.—We hear that Mr. Pumphrey, of Birmingham, has effected a further simplification of his bromo-gelatine films by dispensing altogether with the paper backing.

The Electric Light.—A few days ago the arrangements were completed for placing the electric light in the lavatories, cloak-rooms, and passages of the British Museum. The lights used are Swan's incandescent lamps, each being equal to a dozen candles, the light being very steady and soft. The four large Siemens' lamps in the reading-room still flicker lightly, though an immense improvement has been made in them since their first introduction. This principle, it is believed, will be extended to the MS. departments, and eventually to the large room behind the reading room, and the galleries, which will enable the attendants to supply books to readers in the evening, instead of limiting the time in the winter months to 3.30. Meanwhile, the reading-room has, for the last month, been kept open until seven o'clock, the average additional numbers of readers after five o'clock, the former time of closing, being about forty. Both Mr. Bond and Mr. Garnet deserve praise for thus affording additional facility to those whose occupations during the day have hitherto prevented them from deriving benefit from the Great National Library.

Solubility of Silver Chloride in Hydrochloric Acid.—According to F. Ruyssen and E. Varenne, the solubility of silver chloride in hydrochloric acid has been studied by Stas, Pierre, and more recently by Ditte. The method of procedure adopted by the author was as follows: a standard solution of silver nitrate was added to the requisite quantity of a standard solution of hydrochloric acid, and then the excess of the same solution required to dissolve the known weight of precipitate obtained was determined. The authors found that 1 part of silver chloride required 244 parts of hydrochloric acid for solution. Although the addition of water decreases the solubility coefficient, yet the decrease is not directly proportional to the quantity of water so added. Thus, for eight times the quantity of water added, the solubility coefficient is only doubled. The presence of foreign metals assists the solution to a slight degree. It was ascertained that the presence of mercurous chloride retards, to an extraordinary degree, the solution of silver chloride, one part of which in presence of even a small quantity of mercurous chloride requiring 3,158,152 parts of hydrochloric acid.—*Journal of the Chemical Society.*

◆

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

*** **Erratum.**—The London and Provincial Enlarging Company desire us to state that the "Fisher Boy," by Mr. W. P. Marsh (148), was enlarged by them, and is not upon Morgan's bromo-argentic paper, as we inadvertently described it. Mr. Marsh himself also writes to the same effect.

A Constant Reader of the News.—We regret that the carefulness with which you study our columns is so far behind the constancy of your reading as to lead you to suppose that we have neglected to lay the matter before our constituents. It was fully treated of in our issue of September 2nd, and nothing fresh has transpired since; but Dr. Phipson has been good enough to promise us an account of his further investigations.

D. Muirhead.—1. By preference, add the additional pyrogallic and ammonia, without more bromide. 2. No. 1 picture is under-exposed, light not sufficiently distributed, out of focus, and the figure too large. 3. No. 2 picture has the two faults first mentioned, but might be considerably improved by an experienced retoucher. 4. No. 3 picture is over-exposed, and there are irregular markings which may arise from careless development or from an unevenly coated plate. 5. No. 4 picture is over-exposed, and careful intensification might somewhat mend matters. 6. We do not know: why not write and ask them?

Pilot.—The advantages are doubtful, while many disadvantages are certain. Considering everything, we would advise you not to do as you propose.

T. C. H.—1. In an ordinary funnel, would appear to be the least advantageous method of using a muslin strainer, as the wet material clings to the sides, and therefore becomes to a large extent inoperative. 2. We prefer to tie it over a teapot, by means of an elastic band; the spout then giving vent to the air, and also serving to draw off the strained liquid. If fastened over the mouth of a beaker in a similar manner, one part must be lifted occasionally to give vent to the air. 3. Generally speaking, a single thickness of muslin is to be preferred. 4. Undoubtedly.

J. S. H.—An ordinary india-rubber plate-holder suspended by a string makes an admirable substitute for a turn-table. The string should be wound as much as possible in one direction, and immediately after the plate has been coated with the bituminous solution it should be allowed to hang freely, and have a start given it in the contrary direction. When the turning stops, the film will generally be dry.

F. N. Monte.—We prefer a weak iron developer, and fixation with cyanide.

G. Haberer.—It is quite unsuitable for the purpose.

Cumulus.—Either will do very well, but we prefer No. 2.

Polaris.—Write to Major E. S. Gordon, Royal Arsenal, Woolwich. We have no doubt that he will forward you a copy of his excellent pamphlet.

H. S.—The air-ways of your drying-box are far too small.

Frank G——.—Mr. Smith's address is Colebrook Row, N.

T. Hughes.—Indian ink is a very suitable pigment. Break the sticks into fragments, add enough water to cover and a small proportion of ammonia, heat in a water bath till thoroughly softened, and finally pass through a colour mill. The quantity required must be found by experiment, as samples vary very considerably.

M. T. Hyman.—Add enough ether to your collodion to make it flow readily.

Scotsman.—1. The examples of portraiture do you much credit, not only as regards technical qualities, but also from an artistic point of view. 2. We should strongly advise you to make yourself acquainted with the gelatino-bromide process. 3. The paper appeared in the first number of the present volume.

M. Barker.—You have, like many others, been misled by a similarity of the names. The former is a mineral consisting essentially of calcium phosphate, while the latter is a gum-like product which exudes from a West Indian plant.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1210.—*November* 11, 1881.

CONTENTS.

	PAGE
Instantaneous Exposures	529
The Old and the New	529
The Influence of Light on the Growth of Plants	530
Photography In and Out of the Studio	530
French Correspondence. By Leon Vidal	531
On an Instantaneous Lens Mount. By William Bedford	532
The Detective Camera. By T. Bolas	532
Action of Light on Silver Bromide	533
Notes	534
Topics of the Day.—Electric Light for Photographic Use. By Walter B. Woodbury	535
Reviews	536
Mercury Intensifiers. By Cosmo I. Burton and Arthur P. Laurie	536
Correspondence	537
Proceedings of Societies	537
Talk in the Studio	540
To Correspondents	540

INSTANTANEOUS EXPOSURES.

Perhaps there is no appliance in connection with modern photography over which so much ingenuity has been displayed, or so many modifications devised, as in instantaneous shutters. We have discussed recently the qualities which we consider necessary to constitute a perfect shutter; but it is on the application of these instruments that we propose now to offer a few remarks. Although so much mechanical perfection has been attained in the construction of instantaneous shutters, there still remains the difficulty of deciding on the longest exposure possible that can be given to any moving object, without interfering with the definition of the resulting picture. There is very little doubt, we think, that, in order to represent a moving object in an absolutely stationary condition on the sensitive plate, the motion of the object on the latter should not exceed $\frac{1}{200}$ of an inch. This is a statement which probably will be open to dispute, especially as the character of the object under consideration determines, to a certain extent, the greatest range of confusion admissible. Captain Abney, in his "Treatise on Photography," places ·25 of a millimetre—or about $\frac{1}{100}$ of an inch—as the largest diameter of such a disc which would be indistinguishable from a point; but, in the case of a moving vessel whose ropes would not, in many cases, exceed in thickness a line of $\frac{1}{500}$ of an inch on the plate, a movement of $\frac{1}{100}$ of an inch would have the effect of increasing their thickness considerably. Given the speed of a moving object and the distance from the lens, the longest exposure possible could be easily determined; and, if the plates were sufficiently rapid, a distinct negative would be obtained. We will take a case in point. A vessel is moving across the field of the lens in a direction parallel to the sensitive plate at a distance from the lens equal to 1,500 times its focal length, and at a speed of ten miles an hour. Her actual motion would be about five yards per second, and the longest exposure possible in order that the motion on the plate should not exceed $\frac{1}{200}$ of an inch would be about $\frac{1}{25}$ of a second. Any variation in the conditions specified infers that either the picture will be indistinct owing to movement, or that the exposure has been more rapid than the circumstances demanded. A few examples such as the above worked out for different classes of subjects would give results sufficiently reliable for experimental purposes, and if instantaneous exposures were made with these results as a basis, and found accurate, the experience so gained would be available in connection with a shutter capable of giving variable exposures. The character of light is, of course, an ever-varying factor, but, as a rule, instantaneous exposures are only attempted when the light is at its best.

In an article contributed by Mr. G. F. Williams to the last Year-Book, he states, with great justice, that the true principle of instantaneous photography is to be sought for in the speed of the plates rather than in that of the lens. There is no doubt that in the case of instantaneous pictures taken with a lens of large focal aperture, the falling-off of the illumination from the centre to the margin of the plate, as well as the want of definition, is a very conspicuous defect, and frequently ruins an otherwise perfect picture. Several pictures of this class recently exhibited form a very marked contrast to the famous pictures of Ramsgate sands, the former having probably been exposed under a focal aperture of $\frac{f}{10}$, while in the latter case the aperture was reduced to $\frac{f}{18}$. Gelatine plates, whatever their defects may be, have at all events rendered the delineation of every kind of moving life a possibility, and a careful study of the varying conditions involved will, we hope, convert this possibility, with those who care to undertake such subjects, into a certainty.

THE OLD AND THE NEW.

Now-a-days one hears less and less about the great superiority of wet plate negatives over those obtained by the gelatino-bromide process. Several causes tend to this state of things. In the first place, those who prepare the gelatine plates and those who use them have become more fully alive to the means of avoiding thin, weak, and half-dead pictures; the necessity of using as non-actinic a light as possible, and exposing the plates no more to this than is absolutely necessary, being pretty universally understood; while the need of chemical cleanliness, as regards the vessels used for the preparation of emulsion, has been tolerably well brought home to those who have failed time after time, and have made batch after batch of unsatisfactory and unvigorous plates, through the use of vessels made of absorbent earthenware.

An extremely small proportion of half-decayed or putrefying gelatinous matter will so leaven a large batch of good emulsion as to render it quite impossible to obtain bold and vigorous pictures with it; and if the proportion of decomposing impurity is larger, the well-known greenish iridescent fog or veil sets in fully and unmistakably. It is remarkable to note how many liberties, which the early workers would not have dreamed of, may be safely taken with the gelatino-bromide emulsion. Metal vessels, even those made of iron, may be freely used for the emulsion at certain stages of its preparation, without any mischief following.

A second circumstance which has tended to lessen the general difference which was noticeable between results from the old and the new negatives, is the fact that printers have acquired a mass of useful experience as to the special treatment which is often necessary for the production of satisfactory results from emulsion negatives. The fact of carbon printers being more at a disadvantage than silver printers as regards gelatine negatives has not been without its influence in causing the photographic world to under-estimate the value of a gelatine negative in relation to one obtained by the collodion process. In the present day a printer, whether carbon or silver, who cannot do justice to a gelatino-bromide negative, is behind his time, and must invariably suffer in the struggle for existence.

Under no circumstances do the full beauty and detailed range of gradations of a good gelatine negative show to so much advantage as when the picture is moderately enlarged, say four, five, or six diameters, care being taken not to push the amplification so far as to bring the grain of the original into disagreeable prominence.

The experience of the present time has taught us that as much brilliancy, sparkle, and boldness of effect in light and shade can be attained by the use of gelatine plates, as is obtained by the wet process; while gelatino-bromide negatives suitable for photo-lithography, as obtained by a skilful photographer, can hold their own against wet plate work.

As the store of experience with respect to the gelatino-bromide process grows, we may reasonably expect the results to improve, until the wet process is left as far behind its rival of the present day as the collodion process is now in advance of the Talbotype and wax paper processes.

The two drawbacks in the gelatine process which now most need study are coarseness of grain, and the ease with which solarization or reversal sets in.

◆

THE INFLUENCE OF LIGHT ON THE GROWTH OF PLANTS.

Botanists of old were in the habit of asserting that light played no part in assisting the growth of plants, and that its action, on the contrary, was to a certain extent detrimental. Within recent times Stebben has investigated the subject, and his experiments, which point to a very different result, were reported to the Physical Association at Zürich.

Working with several descriptions of plants, important from an agricultural point of view, he found that the action of light was very much more powerful than that of heat. For instance, the seeds of the grass plant (*poa memoralis*), when exposed to daylight, germinated to the extent of 62 per cent., while in the shade, only 3 per cent. showed signs of springing. Owing to the varying quality of sunlight, and the difficulty of obtaining reliable data by its means, experiments were continued by the aid of gaslight, and results of a similar character obtained. According to Jauchon, seeds, during the process of springing, absorb from 25 to 50 per cent. more oxygen under the action of daylight than in the dark; but this difference is only to be detected one or two days after the seeds have been exposed.

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO

Dried Gelatine Foam—Tact in a Studio—Manufacturing "Worthless Dry Plates."

Dried Gelatine Foam.—Gelatine has attained so important a position in photography, that any improvement cannot but be interesting. The diversity of opinion in regard to the merits of the various commercial plates is very striking, and, we venture to say, must be as puzzling to the makers as to the users. In one respect the manufacturer of gelatine plates is at a disadvantage—that is to say, he does not make the vehicle in which the sensitive salts of silver are suspended, and therefore can only test its suitability by experiment. Whether samples of gelatine are as constant in their composition and purity as samples of collodion made by a known formulæ may be doubted; in addition to which there is the decomposition to which gelatine is liable unless kept perfectly dry. It is said that one of the greatest difficulties in evaporating gelatine solutions lies in the fact that the gelatine is very sensitive to the changes in the temperature and hygroscopic condition of the air, and that often large quantities are rendered valueless by such sudden and uncontrollable changes. To overcome this difficulty, a new method of preparing gelatine, so as to perfectly desiccate it, has been suggested. The process consists of two steps: first, in subjecting a solution of gelatine in water to violent agitation, or to the action of air currents under pressure, so that air is mingled with the solution, and it becomes foamy; and second, in evaporating the water from the foam by subjecting it to the action of cold dry air. The effect of this desiccating process is to produce a dried gelatine foam which is extremely pure, and of necessity in a very finely-divided state. The chief thing to be observed seems to be in the exact strength of the air currents. If these air currents are too forcible, the bubbles burst instead of bearing a hard film. The temperature also should be only low enough to chill the gelatine film of each bubble, and assist it in retaining its shape until dehydrated. It is claimed for this dried gelatine foam that, as the solution is not exposed to such an extent as it is when the old methods of evaporation are employed, there is no opportunity for dust and foreign substances to become incorporated with the gelatinous product. In addition, although the gelatine is so completely dehydrated that it may be preserved unaltered for an indefinite period, yet it dissolves with great readiness in water. If all be true which is said of gelatine foam by its inventor, it ought to be peculiarly suitable for photographic use.

Tact in the Studio.—The art of extracting ready money from the pocket of the sitter seems, after all, to resolve itself into a question of tact. Some men make the request so clumsily that the sitter almost feels as if a kind of black mail was being levied; others, on the contrary, insinuate the condition with a degree of pleasantness which quite removes the disagreeable sensation of being one of the class of paymasters which the proverb declares to be bad—those who pay beforehand. One of the most successful of English photographers (he is gone to the majority now, so that there is no harm in quoting his words) used to say that he never cared for a customer to have the intention of spending more than a guinea on entering the studio, for he looked upon it as a shame and a reproach if he did not get twenty or thirty guineas out of him before he left. Of course, it need not be said that the *clientele* of this skilful tactician was a wealthy one. A very effective "dodge" was to have a darkened room attached to the studio, in which a lantern and screen were placed. Supposing the sitter only intended to have a dozen cartes, he would be invited to step in for a moment; and, to his delight, he would see a life-size enlargement of the negative just taken thrown upon the screen. The desire once excited of having a painting in oils, life-size, was generally too strong to be resisted, and hence would follow the thirty or forty guinea order, as a matter of course. Whether these "dodges" for increasing business can be called legitimate, is another matter.

Manufacturing "Worthless Dry Plates."—This question of prepayment has been taken by Captain Turton as a peg on which to hang some strongly-worded remarks respecting the makers of gelatine plates. In *Public Opinion*, a few months ago, appeared a letter signed "Justitia," in which the writer asks the question whether the rule of prepayment, which, he asserted, was peculiar to the trade of photography, was either fair to the public, or necessary in the interests of the photographer? This is a question about which photographers will have but one opinion, and, therefore, it need not be discussed here. But the writer goes on to say: "Now that the difficulties of the art are so minimized that exposure of the plates for one quarter of a second or less is sufficient, I submit that this rule might be abolished; and I would suggest that a deposit (say of one-sixth the full payment) be forfeited by a "sitter" who may be dissatisfied with the proofs." There may be something in this suggestion worth consideration; but we certainly fail to see that the shortened time of exposure has anything to do with it. If it were true that the difficulties of the art were minimized, this would not affect the question of prepayment, since the reasons for dissatisfaction with a portrait arise as much from the vanity of the sitter, as from any shortcomings on the part of the photographer. This view of "Justitia" may, then, be at once dismissed. Not so the allegations of Captain Turton, who, in the same journal of a fortnight ago, in answering "Justitia," warns amateurs that a large number of quite worthless dry plates are often sent out, especially to those amateurs who are supposed to be inexperienced, and who cannot readily tell a good plate from a bad one. He adds:—"There is thus great trouble and annoyance caused, and many workers who would otherwise pursue the charming art, are disgusted, and throw it aside. This is chiefly owing to the greed of unprincipled manufacturers who wish to make money rapidly, and care little for the discredit they bring on photography, so long as they fill their pockets quickly." This is a serious statement to make, since it affects the whole of the manufacturers of dry plates; and, we would ask, is it true? We have already pointed out that the plates of one maker fail in one man's hands, when they will succeed perfectly in the hands of another. Does it, then, follow that those plates only are good which turn out well, no matter who manipulates them? As for making money rapidly by sending out worthless plates, we fancy that any manufacturer who commences with this idea will soon find he has sorely deceived himself. A gelatine plate is not like a patent pill; it does not require "faith" to bring forth its virtues. The amateur photographer who is so ignorant and heedless as to rush and spend his money on advertised plates, without seeking to enquire something of their merits, is, we believe, a *rara avis*. Photographers, whether professional or amateur, are very prone to talk "shop," and it is scarcely possible for a manufacturer to send out bad plates systematically, without the fact becoming speedily known. We are inclined to think, for obvious reasons, that Captain Turton will have some difficulty in establishing his position.

FRENCH CORRESPONDENCE.

The Electrical Exhibition at Paris—Awards to the Exhibitors—The Dry Bichromate of Potash Pile and Dry Accumulators—Gelatino-Chloride Preparations—Photographic Printing on Woven Fabrics.

The Electrical Exhibition at Paris.—The International Exhibition of Electricity will probably not remain open after the 15th of this month. There are two strong reasons for adhering to the date of closing, as originally fixed. First, a similar exhibition is being organised in England to be opened on the first of December; it becomes therefore necessary to close the one at Paris in time to allow of the exhibitors taking part in that at Sydenham. Secondly, the cold weather, which is gradually getting more rigorous, renders the exhibition at Paris anything but an agreeable resort of an evening; dangerously cold draughts are very prevalent, and I know many people who have caught severe colds there. Even if it should be proposed to keep the Paris exhibition open independently of the proposed exhibition in England, the building will have to be arranged for the winter season; that is to say, all the galleries will have to be provided with stoves, and all the doorways with hangings.

Awards to the Exhibitors.—The awards to the exhibitors have just been published, and I am glad to be able to congratulate our esteemed colleague, Mr. Swan, on his well-merited gold medal; his electric lamps, together with those of Edison and Maxim, have been much admired. Our other colleagues, who exhibited the application of electric lighting to photographic purposes, have only been awarded bronze medals. Some of them are greatly disappointed, but I think they fail to place themselves in the same position as the jury. They must not forget that this is an electrical, and not a photographic exhibition; if they desire to have a first-class place among photographers, they can hardly expect as much among electricians, where of course they must give way to inventors and the more important manufacturers. Besides, there are electricians who, like M. Trouvé, have made numerous electrical discoveries, and have exhibited a remarkable collection of instruments, and yet have received nothing but a silver medal. This fact ought to console M. Liébert and our other colleagues for the bronze medal which has been awarded to them; they should regard it more in the light of a memorial of the exhibition than in that of an award; in fact, it is nothing more than a certificate of their having taken part in the exhibition.

The Dry Bichromate of Potash Pile and the Dry Accumulator.—If I were to allow myself to be carried away by the interest of my subject, I should very soon exceed the limits allotted to me; I should like, however, to say a few words on the dry bichromate of potash pile exhibited by M. L. Desmelles. Instead of filling the cell with a solution of bichromate of potash, M. Desmelles makes a paste of asbesto soaked in water saturated with bichromate, and this paste he inserts in the pile. In this way he has constructed a very ingenious instrument for lighting gas; it consists of a thin piece of the paste, placed in a box; when the instrument is to be used, a slip of flexible zinc is applied, and this gives a sufficient current to render a thin thread of platinum red hot, kindling the gas. This idea of solidifying, if one may say so, the different solutions which are ordinarily employed in batteries for producing a current, seems to me to be a very ingenious one. We have thus, in a small compass, a pile of considerable energy forming a very portable generator of electricity. Perhaps we may soon see this system applied to pocket lanterns, and the light might be rendered of longer duration by combining with the battery a little accumulator of the kind invented by Planté. M. Desmelles has already adopted this method of utilising his dry pile, and if the apparatus were reduced to a minimum size, we could carry with us a small store of electricity useful for many purposes. The correlation which exists among different scientific inventions is of such a kind that I feel convinced of one day seeing electricity affording most powerful assistance to photography. It must not be forgotten that electrical energy can with readiness be converted into that of heat, of force, and of motion, and that, besides, it gives rise to electro-chemical effects which should be capable of being applied to photographic work. I am not speaking of its employment for the purpose of executing photo-engraving by means of electro-plating, but of the formation by its means of a latent image. Under the influence of electrical currents properly directed, results can be obtained in the camera which differ considerably from those produced under ordinary conditions, and it is possible that we shall here find an opening for new discoveries of the very greatest interest. By means of accumulators, we are able to condense a great quantity of electricity within a limited space, and we shall thus succeed in realising a number of new applications from which photography cannot fail to derive great advantage. The subject of accumulators is attracting great attention, and many of our best known physicists are taking it up. After M. Planté comes M. Faure, who, following in his footsteps, claims to have found a means of storing a much larger quantity of electricity. I think there can be no doubt that before long we shall have a really powerful accumulator, and, at the same time, an instrument restricted both in size and weight. The distribution of electricity for domestic purposes, in the same way as gas is supplied for lighting and heating, will be a most successful solution of the problem, so far as regards the inhabitants of populous centres. We should have at our disposal not only light and heat, but also motive and electro-chemical force, provided that this distribution can be regulated under conditions of expense, so as to make it available for the majority.

Gelatino-Chloride Preparations.—Since MM. Eder and Pizzighelli have published their remarkable work on the gelatino-chloride process with the chemical development, I have been often asked for information on the subject. The question is put to me: "Are there any persons who manufacture for sale gelatino-chloride of silver films, either on glass, on paper, or on pellicle?"—and to this question I am compelled to answer regretfully, "I believe not." The preparation of these films is, however, much to be desired, as it could be taken up side by side with that of gelatino-bromide. There is certainly an opening for the manufacture of gelatino-chloride paper to be used for rapid positive printing, and I think that a house like that of Morgan and Co., which manufactures gelatino-bromide paper, should also be in a position to prepare gelatino-chloride paper. This paper, which is capable of being intensified, renders prints with a very agreeable tone, and although the sensitiveness of gelatino-chloride is considerably less than that of gelatino-bromide, it can be worked under artificial light with sufficient rapidity. There will be a great demand for gelatino-chloride of silver paper.

Photographic Printing on Woven Fabrics.—A new photographic industry has recently been organised in Paris, and its workshops are established at Billancourt, a suburb of the metropolis; its principal object being the production of photographic prints on woven fabrics, silk, cotton, or wool, either in monochrome or polychrome. The directors of these works are able to dispose of a large capital which will allow them to produce, in addition to the objects indicated above, any other applications of photography. Under the management of a very talented man, M. Janard, this business promises to be very prosperous, for it meets a great want by introducing photography into the industry of printing on woven fabrics. By M. Janard's process a square metre in surface of silk or cotton cloth can be printed for the modest sum of thirty or forty centimes. It can be readily imagined what can be done in this direction, particularly if colour can be introduced into the photographic work properly so called.

Leon Vidal.

ON AN INSTANTANEOUS LENS MOUNT.

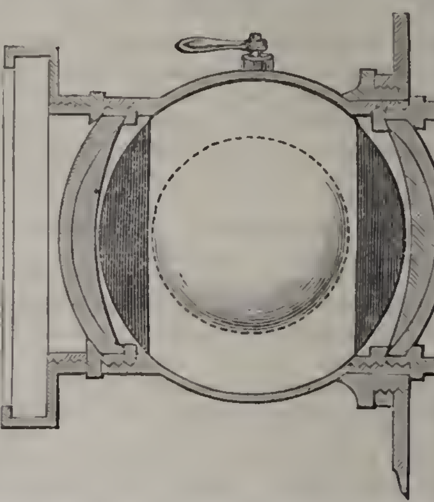
BY WILLIAM BEDFORD.

I have lately been constructing an instantaneous lens mount which may, perhaps, be found useful in cases where an extremely rapid exposure is required with a quick-acting lens, and where compactness and portability are essential.

Until quite recently I thought I might lay claim to originality of design; but I now find that Mr. T. Bolas has availed himself of the same principle, which he has ingeniously adapted to the latest form of his "detective camera"; however, as I am not aware that the idea has been hitherto published, I send a short description.

The original intention was to contrive an instantaneous shutter which should be included in and form part of the lens mount, and without, if possible, some of the disadvantages of those already existing.

The simplest form of shutter contained within the mount would probably be a thin metal disc turning on centres at opposite points of its circumference, so that a half revolution would open and close the lens, and thus effect the exposure; but although the thickness of the disc when the lens is open probably would not materially affect the result, yet the maximum opening of the lens would be exposed for a very short time compared with that occupied in effecting the half revolution of the disc. This and other considerations led me to devise the ball-and-socket exposing valve, of which I give a diagram, where, in order to make the arrangement more clear, the ball-and-socket are represented in perspective inserted in a cross section of the lens. Although I have not yet practically worked out this design, the one I have made is very similar to it, and almost identical with the stopcock arrangement of Mr. Bolas previously alluded to, the only difference being that Mr. Bolas prefers to place his between the lens and the sensitive plate, whereas mine acts between the lenses of a double combination. In this latter position the ball-and-socket principle would possess the advantage of occupying less space, as the lenses can be brought nearer to a ball than to a cylinder of the same diameter, so that a larger working aperture of the lens is available.



In the diagram, the dotted circle marks the position of the apertures in the thin metal ball when the light is turned off. These apertures do not act as a stop, but allow the image to fall on the plate, in much the same manner as a shutter sliding near the plate does.

All existing instantaneous shutters have, however, it must be acknowledged, one serious objection. They do nothing to correct, but in some cases rather tend to increase, the great inequality of illumination, which is the property of all double combination lenses worked with large apertures, so that only the centre of the plate is fully lighted. In this connection the question is suggested whether the lens itself might not be made to swing on its true centre, so that we might make use only of the full power of the centre of the image, operating in turn from one extremity of the plate to the other? Of course there are optical as well as mechanical difficulties to be surmounted before any such principle would be practicable; but when we remember what was effected in the case of Johnson's Pantascopic camera, may we not hope to have a somewhat analogous principle successfully applied to such an important branch of the art as instantaneous photography?

THE DETECTIVE CAMERA.

BY T. BOLAS.

The experience of a summer's work with this apparatus has demonstrated the desirability of using lenses somewhat more rapid than the symmetrical objectives which have been in use hitherto, especially when in-door work has to be done; and a study of the conditions under which portrait combinations might be used with full aperture has led to the construction of an apparatus which unites in itself numerous novel points of advantage, and which has been patented with the view of introduction in the market.

It will be borne in mind that the defining power of a portrait combination for an object in perfect focal adjustment need not be inferior to that of a symmetrical lens, which is stopped down to an aperture of $\frac{f}{9}$ or $\frac{f}{10}$; but the portrait combination will not include objects in such various planes as the before-mentioned symmetrical lens; neither will its limits of sharp definition extend over so large an area. These limits to sharp definition do not much affect the usefulness of the "detective camera" pictures, or, at any rate, their disadvantages do not out-weigh the advantages of an exposure reduced to one tenth. In order, however, to avail oneself of the full defining power of a portrait lens, an extremely accurate focal adjustment is necessary, and this can only be attained by the use of a finder and eye-piece. When the best results of a portrait lens, working with full aperture, are required, it is not advisable to employ ordinary dark slides; as even if adjusted accurately in the first place, the unequal bending and shrinkage of the wood is generally sufficient to put some of the plates out of adjustment, and a difference of one-hundredth of an inch will seriously mar the definition.

A consideration of the above circumstances has induced me to give the detective camera the form described below; a plate two-and-a-half inches square being covered by an ordinary carte lens, and in good average daylight a satisfactory picture may generally be obtained when the camera is held in the hand.

All designs in which a store of plates is contained in the camera itself, are out of the question for ordinary detective work, as the exposed plates must, in ordinary case, be sent up in their receptacles to head-quarters for development.

The essential points of the apparatus are shown in section by the accompanying drawings.

A and A, fig. 1, represent a pair of ordinary portrait lenses actuated by one single pinion; this being moved by the milled head H. The image formed by the objective may be received on a sensitive plate placed in the receptacle passing through the back, D, this plate being kept steady and immovable by a screw. At E is shown, in section, a sliding shutter, intended to keep the light out of the receptacle D.

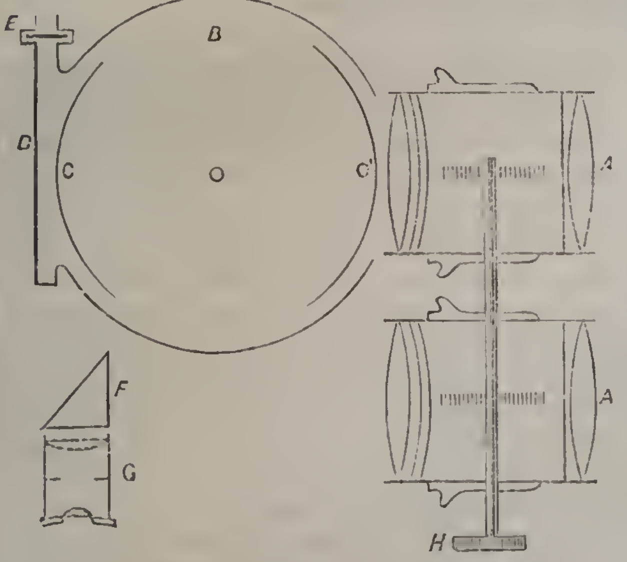


Fig. 1.

In the cylindrical chamber, C B C, there revolves, on centres, another cylinder, which is open at the two opposite or bearing parts (B and opposite). When this cylinder is shown in the position in the diagram, the rays of light passing through the objective, A, are screened from the sensitive plate; but if this revolving cylinder is turned round in either direction to the extent of one-fourth of a circle, the image formed by the lens impinges on the plate. When a quick, or so-called instantaneous, exposure is required, the revolving cylinder is turned rapidly round through half a circle, it being actuated by a spring attached to the axis.

F, is a right-angle glass prism, intended to reflect some of the rays from the objective, A, into the eye-piece, G; and the positions of the prism and eye-piece are so adjusted that when a sharp image of an object is projected by the finder lens on the central portion of the sensitive plate, the same object hall be clearly and sharply seen by an observer looking through the eye-piece G.

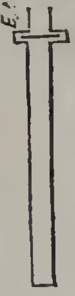


Fig. 2

In order to change those plates which have been exposed, separate slide receptacles, shown in section by figure 2, are employed, and these are made of metal or other suitable material, a sliding shutter at E serving to exclude the light. The mouth of the movable receptacle being fitted to the mouth of the receptacle which forms part of the camera, a plate may be easily shifted from one to the other by turning the apparatus over. The surface of the prism, F, which is next to the eye-piece, G, may either be polished, or left rough like an ordinary focusing screen. The essential parts of the apparatus as now described are enclosed in an outer casing of metal, wood, ebonite, or other suitable material.

It will be obvious that the field of view of the finder is much more limited than the actual area of the picture to be obtained; but this is no serious disadvantage in the actual practice, as one will naturally focus on a central object.

As regards the shutter, which in principle is precisely analogous to an ordinary stopcock, I have found that it can be worked at an extremely high speed, with far less tendency to move the camera than any other form which has come under my notice; the reason of this doubtless being the fact that the weight of the moving part may be perfectly balanced, so that during revolution the position of the centre of gravity of the whole apparatus need not shift. An exposure of one-hundredth of a second may easily be attained by the use of a single india-rubber spring.

About a fortnight ago Mr. W. Bedford, knowing that I had a new hand-camera, asked me to show it to him. After I had done so, and I had told him that the principle of the shutter was original as far as my knowledge went, he informed me that he had some time ago constructed one on an analogous principle, which he tried between the lenses of a compound objective; a position for it which I tried, and discarded, as regards the detective camera, for several reasons. Some days after this Mr. Bedford showed me his stopcock shutter, but as the cylindrical surfaces worked with friction against each other, all the special advantages and ease of motion of my form, in which a clear air space is left and the inner drum turns on bearings, are lost.

I have requested Mr. Bedford to publish an account of his shutter simultaneously with this description of mine.

On the last-mentioned occasion, Mr. Bedford informed me he had designed an analogous shutter, but with a ball revolving in a socket instead of one cylinder turning in another. Such an arrangement, if worked on bearings, as in the case of my cylinder shutter, instead of with friction over the whole surface, would doubtless possess very great value when placed between the lenses of any composed objective in which sufficient room exists.

◆

ACTION OF LIGHT ON SILVER BROMIDE.

In the *Comptes Rendus*, M. G. Noel has recently published some interesting results on this subject which are summarised in the *Journal of the Chemical Society* as follows:—It is well known that when silver bromide is exposed to the action of light for a short time it undergoes a molecular change, which is not apparent until the bromide is treated with some reducing agent. The author has found that when plates which have been exposed to light are kept in the dark for several months, they give no reaction with reducing agents, but behave just as if freshly prepared. Such plates, when again exposed, give as good an image as fresh plates. He finds that plates covered with silver bromide in emulsion in collodion lose all traces of the impression at the end of two months. Silver bromide produced by dipping a bromo-idised collodion film into a solution of silver nitrate, after exposure, retains its power of giving an image with reducing agents for a little more than five months; gelatino-bromide of silver gives an image which is very faint, but shows the principal details at the end of seven months. It would appear from these results that the more sensitive the silver bromide, the longer does it retain the peculiar molecular condition produced by the action of light, and that when this peculiar condition has disappeared, the bromide recovers its original sensitiveness.

Notes.

The Photographic Exhibition in Pall Mall closes to-morrow night.

Dr. J. M. Eder has been nominated Professor of Chemistry to the Institute of Architects in Vienna.

We are glad to announce that Herr Fritz Luckardt, of Vienna, will describe his method of retouching in the Year-Book for 1882.

At the technical meeting of the South London Society, the President made a good suggestion as to the application of Mr. Francis Galton's camera for securing types of character. Mr. Galton, as our readers know, impresses a sensitive film with the features of a number of persons one over the other, and so, on development, does not, of course, get a picture of a man or woman, but of a type of man or woman. The Rev. Mr. Statham believed that a type-camera of this nature might be made use of in connection with the Darwinian theory; type pictures of animals possibly would show us something more than we may know at present about them.

We must congratulate Mr. Jarman upon his clear and succinct exposition of the electric light at the technical meeting. His little lecture deserved a better fate than to come in at the fag end of a long and busy evening. Sir Humphry Davy's first exhibition of the electric light at the Royal Institution early in the century, as Mr. Jarman rightly said, from 2,000 double plates, and the establishment by Professor Holmes of the first electric light-house at Dungeness in 1859—the electric spark piercing the dull gloom and shining over the dark waters so brightly that at thirty miles it had all the brilliancy of a star of the first magnitude—these two events were justly mentioned as marking distinct eras in the history of electric lighting. As regards Mr. Jarman's own apparatus, there is little doubt that it is the most simple, as it is the most inexpensive, of all electric arrangements yet proposed for photographic portraiture.

Mr. Robert Faulkner, by the way, made an apt suggestion on the subject. The light might be useful, he thought, in the daytime during the dull winter months, when fog and smoky weather drive the photographer to desperation. Mr. Jarman's lamp could be employed as an adjunct to daylight; it would accentuate the high lights, and its glare would not be nearly so perceptible as at night.

The Edinburgh Society is flourishing, for it musters nearly five hundred members! It must be some gratification to the energetic honorary secretary, Mr. M. G. Dobbie, to know that in return for the activity he displays, he represents the executive of probably the largest photographic society in the world.

In judging the pictures for medals at the present exhibition, according to the President, only those exhibitors who secured the votes of four of the jurors received an award. Those who received less than four votes, the President thought should nevertheless be honorably mentioned, their names being:—Mr. T. M. Sutcliff, Miss Miles, Captain Brownrigg, the School of Military Engineering, Mr. A. Reynolds, Mrs. S. G. Payne, Mr. Payne, Mr. F. Schwabe, Mr. H. Pointer, Messrs. Hills and Saunders, Mr. J. S. Catford, Professor W. H. Donkin, and Mr. Axtmann.

We are glad to find that the jurors have added the name of Mr. E. Whymper to the list of medallists. As we did not hesitate to complain of the omission of his name in the first instance, so we now heartily commend the action of the jury in revising their decision.

Professor Stokes tells an interesting story in *Nature*:—"The late Mr. Carrington for many years was engaged in a series of most careful and elaborate measurements of the positions and magnitudes of the solar spots. The way he worked was by throwing a large image of the sun by means of an equatorially-mounted telescope, with its eyepiece suitably focussed, on to a fixed screen. One day he was engaged at this work when he saw two bright spots on the screen. His first impression was that the screen which was used to shut off the light of the sun, which otherwise would have passed down outside of the object-glass of the telescope, outside the tube, had got disarranged somehow or other, and that it was merely the sun shining through the holes, and coming on the screen. He moved the telescope a little, and these spots moved with the image of the sun, proving that it was not merely the sun shining through holes in the shading screen, but that they really belonged to the sun.

"Now it so happened that on examining the records of the magnetic needle, which were kept automatically by a photographic process at Kew, just at the moment when these spots were seen, there was an unusually great magnetic disturbance." A better proof could not be afforded of the invaluable service that photography renders in recording unceasingly, day and night, the movements of the magnet as this becomes influenced by earth currents now and again. Not only did the photographic records in this case prove incontestably the truth of Mr. Carrington's observations, but it plainly demonstrated, what one could hardly have foreseen, that sun-spots and magnetism are connected with one another; or, indeed, that three terrestrial phenomena are in close relationship, viz., magnetic disturbances, auroræ, and earth currents. To photography, then, must be attributed a most valuable discovery.

At the first meeting of the French Photographic Society, held on the 4th inst., a good deal of interest was shown for a new "Chronometrical" shutter, invented by M. Paul Boca. It is said to secure an exposure of any limit from the fiftieth of a second to five seconds. A little dial finds a place under the lens, and the duration of exposure is fixed by moving the hand of this dial. M. Léon Vidal will explain the invention fully in his next letter.

An admirably simple and effectual method of drying a few plates is to line a band-box with layers of paper or calico, to dry this thoroughly before the fire, and, after its removal from the fire, to leave the plates in the drying-box all night. If the dried band-box is protected from external moisture by being placed in an old tin trunk, its effective drying power is much greater than otherwise.

Chloride of calcium and sulphuric acid are not altogether pleasant desiccating agents to work with, and in many cases the very considerable hygroscopic properties of dry vegetable fibre may render good service.

Mr. Nelson Cherrill has just arrived from Christchurch, New Zealand, where he has resided for the past five years. Domestic affliction was the unfortunate cause of Mr. Cherrill's sudden departure from Christchurch, where he had not only established himself at the head of his profession, but was conspicuous as a prominent member of the town council. His early training as a civil engineer was singularly useful in his new home, his last official work being to design a system of water-works for the city.

Mr. Cherrill does not speak hopefully of a photographer's prospects in New Zealand. "I have nothing to complain about, personally, for I suppose I photographed everybody in Christchurch; but it is only a town of small dimensions. A stranger would be remarked at once: 'Why, who is *he*?' you would say to yourself; 'I don't remember having photographed him: I suppose he will come to-morrow.' Mutton chops are only a penny a-piece; but then you have to pay a lad fifteen shillings a week, or a sovereign, if he stop with you a twelvemonth."

Topics of the Day.

ELECTRIC LIGHT FOR PHOTOGRAPHIC USE.

BY WALTER B. WOODBURY.

Having been one of the first to use the electric light for photographic purposes as far back as in 1866 in Manchester, and later at Hereford Lodge, Brompton, the particular purpose then being for the production of photographic reliefs, I may perhaps be able to give your readers a few notes on the subject—more especially as I have spent some days lately at the electric exhibition in Paris.

Everybody who has visited that luminous show must have been astonished at the number of systems for producing the electric current, both by motive power and by modified forms of batteries.

The first thing that struck my attention was the great difference in colour (actinically speaking), between the arc lamps and the incandescent, the latter, from their resemblance to our ordinary gaslight (by contrast with the arc, perhaps), not giving a very favourable view of their advantages for use in photography.

It remains to be seen if, with the same expense necessary to produce a certain amount of electric energy, an equal amount of actinic light suitable for photography can be obtained. In that case the advantage of distribution of the light in a studio becomes at once in favour of the incandescent. Before proceeding further, let me assert that I have no interest in any of the different systems of lights or light producers, therefore my opinions are perfectly of an unbiassed nature. That the tiny incandescent and fairy-like lights of Swan are superior in power and whiteness of light to those of Edison I am compelled to admit, the other lamps of similar form ranging between the two. Owing to M. Vidal's absence, his admirable selemometer has only just found a place in the Exhibition, or I might have had an opportunity of saying more on this point. But as there is still some time left, he will doubtless, through his letters, as correspondent to your journal, give us some further information on this point; and if not, I hope his instrument will be placed in the Crystal Palace, and a series of experiments thoroughly worked out, and its advantages also shown in its use in studios, to determine the actinic power of the light.

Undoubtedly, for nineteen photographers out of twenty, the steam or gas engine and the electric motor necessary to give an equivalent to daylight in the studio is practically out of the question, as some hundreds of pounds must be expended before this system could be adopted, to say nothing of the superintendence necessary with either class of engine, the greater expense of the latter annulling the advantages of facility in its working.

Therefore, for the present, the photographer who has not the necessary capital to expend in a motor must be content with a battery. Now the question arises, which is the best system? Evidently the one which will require the least frequent renewal, and give the most light, without any noxious fumes, for the longest space of time.

The simple bichromate battery is doubtless very useful for an hour's lecture experiments, but its great momentary force is soon exhausted, and the constant renewal of the bichromate and acid solution is not a pleasant or an easy matter.

Grove's and Bunsen's batteries have the same faults as the other, giving off disagreeable fumes which would affect the photographer's clients' nasal organs, worse than the long-complained of and now nearly obsolete collodion.

The Leclanché batteries, and others of a similar nature, although very constant, are unfit for the purpose, but there are several new systems now working at the exhibition that are well adapted to meet the requirements of the photographer. Among others I may mention one which struck my attention peculiarly; it is called the impolarizable battery, and consists of a series of cells ranged on a row of shelves, forty to sixty being necessary to produce a light of two hundred candle power, the great advantage being, according to the inventor, that by simply re-charging two or three of the elements per day, this light may be kept up and daily used for six or seven hours, at a cost of about threepence per hour. The cells are of peculiar construction, having a porous jar with two small ones made in one piece attached, one having long slits down the side; this is filled with crystals of bichromate of potash, and the other with strong sulphuric acid; the one dissolves gradually as required, and the other filters through the pores of the jar, both into the surrounding liquid contained in the outer jar. This latter contains a solution of bichromate of potash and sulphuric acid, such as is used in the ordinary bichromate battery. The centre and largest porous cell contains a solution of common salt water and vinegar, in which the zinc element is inserted, two carbons joined by a piece of lead being placed in the outer cell containing the bichromate solution. It will be seen that to produce the same amount of light three or four times the number of piles would be required than in the ordinary bichromate battery, but the small amount of attention necessary would well compensate for an extra preliminary outlay. The battery, I may mention, is so arranged that by the movement of a handle the whole of the elements may be removed from the liquid excitants when not required to be in action.

To further follow the inventor's description, the bye-product oxide of chromium is of the greatest purity, and of more value than the materials used; therefore, if there was sufficient demand for this green colour the photographer could have his light for less than nothing.

Messrs. Latimer Clark and Muirhead also exhibit an excellent form of battery for telegraphic purposes, giving great electro-motive force, which I had an opportunity of testing in connection with my balloon camera; whether it would be so well adapted for the purpose in view I am unable to say. Mr. Latimer Clark's name is well known to all old photographers, and in their interest he might, perhaps, from his knowledge of the subject, be able to supply our wants; that is, until such time as we may have our electricity laid on like the gas—a time which I think is not far distant.

The "Topic" next week will be, "Photographic Residues and Waste: What is worth saving, and how I save it"; by Hadah, and Selimo Bottone.

◆

Reviews.

TRAITE PRATIQUE DE PHOTOGLYPTIE. By M. Léon Vidal. (*Paris, Gauthier Villars*).

WE have already described in these columns the modificafications that Mr. Woodbury has recently made to the process which is familiar to our readers under his name, but it is of course impossible, within the limits of a newspaper article, to set forth in proper detail all that is necessary to those who desire to work the process, or to learn about the various manipulations that may be involved; for this reason the volume that M. Léon Vidal has published is very welcome. Woodburytype, or photoglyptie, as our French friends choose to term it, is no longer a single process, but is the basis of several important printing methods of the present day, from the very simple modification which Mr. Woodbury has elaborated, in which the massive hydraulic press and complicated printing paraphernalia fall away altogether, to the *photogravure* method of M. Rousselon (Goupil et Cie.), in which the ordinary process of engraving is grafted upon Woodburtype.

M. Léon Vidal's object, however, more especially in publishing this complete little volume, has been two-fold, viz., to give a sketch of the history of Woodburytype, and to show how easily Woodbury prints may be produced to-day since the inventor's last simplification of his process. Those interested in the production of permanent pictures by relief-printing—and few photographers are not—will be glad to peruse M. Vidal's work, which has been written with much care, and is abundantly illustrated. We must congratulate our colleague not only on having produced a book which is exceedingly practical and instructive, but one that is attractive and interesting into the bargain. One little slip only has come to our notice; that in which Mr. Warnerke is credited with the idea of employing Spenco metal for taking moulds of photo-relief images; the suggestion was made in these columns, as Mr. Warnerke points out in the first article he wrote on the subject.

THE PHOTOGRAPHIC AMATEUR. By J. Traill Taylor. (*Scovill Manufacturing Company, New York.*)

MR. TAYLOR'S little book deserves a word of commendation on this side of the water, and we are very glad to give it. It numbers scarcely a hundred pages—an advantage, we think, since it contains quite sufficient to instruct the student, without encumbering him with any useless details. The wet and dry processes, the author tells us, have been so described that those entirely unacquainted with photography can thoroughly understand them, and, so far as we are able to judge, the object has been most successfully accomplished. The chapter on the "Construction and Uses of Photographic Lenses" is one of the most useful in the little book.

◆

MERCURY INTENSIFIERS.*

BY COSMO I. BURTON AND ARTHUR P. LAURIE.

DURING last season we read a paper before this Society on "A New Mercury Intensifier," which also contained a scientific explanation of the action of the one commonly used. Since then we have made a few experiments, and inquired a little into the subject of mercury intensifiers. We were rather afraid to bring up this subject again, as it occurred to us that though we had not tried our intensifier in practice, it did not follow that others had not, and that we might be bringing down on our devoted heads a storm of adverse criticism.

Mr. Henderson, of London, has recently proposed using lime instead of ammonia after bleaching the negative with mercuric chloride.

Slaked lime is slightly soluble in water, forming the solution known as lime water. We bleached a negative in the usual way, and then put it in lime water. It darkened very slowly. Another piece of the same negative we covered with a paste of lime and water. This acted more rapidly, and the result was exactly the same in both cases—a rather dirty yellowish-brown negative. This process may be useful in practice, as the lime produces a deposit of very different appearance from that produced by ammonia, and the possibility of varying the results is always useful. Caustic potash will act in place of ammonia, but is rather too corrosive a substance to be used with safety. There is one important point to be remembered in using lime—its action is entirely different from that of ammonia. Ammonia combines with the mercurous chloride to form dimercurous—ammonium chloride, the black substance which darkens the negative. The action of lime is much simpler; it removes the chlorine from the chloride of mercury, forming chloride of calcium, and leaving in negative black oxide of mercury. Now the following statement occurs in several chemistry books: "Black oxide of mercury is decomposed by light into metallic mercury and the red oxide." This intensifier, therefore, must be used with caution, and its permanency carefully tested. With reference to the intensifier which we described in our last paper, we have not much more to say, except that bromide of mercury is rather more soluble in alcohol than in water, so we tried a solution in alcohol, and found it bleached the negative somewhat more rapidly than the water solution. We also made a few experiments with a view to using pyrogallic instead of the ferrous oxalate we formerly advised. Pyrogallic and ammonia will not do, so we tried caustic potash in place of ammonia, and it acted very decidedly; in fact, caustic potash alone will act, though of course in a different way. But its action is too violent, generally removing the film from the plate, and, if strong, dissolving it completely. We also tried lime water and pyrogallic; this acts fairly well. On adding the pyrogallic to the lime water, a beautiful violet colour is produced, which disappears in a few seconds. Baryta water is better than lime water, because barium hydrate is more soluble than calcium hydrate; it can easily be procured from any chemist. Pyrogallic by itself has hardly any action.

On trying our intensifier on a collodion negative, we got rather curious results; immediately on immersing the negative in the solution of chloride or bromide of mercury, the image, which, to begin with, is light grey, becomes nearly black, and is made considerably more dense. On remaining in the solution for some time the image bleaches in the same way as a gelatine negative, and may be intensified either by the ordinary chloride of mercury and ammonia process, or by the method we described in our last paper.

And now, as this is all we have to say for the present about mercury intensifiers, perhaps we may be allowed to go beyond the title of this paper, and say a few words on the silver intensifier. It has lately been proposed to use for gelatine negatives the ordinary silver intensifier commonly used for collodion. On this subject we received the following information:—

"If a gelatine negative is soaked in alum and hydrochloric acid,

Saturated solution of alum	1 pint
Hydrochloric acid	1 ounce

---

* Read before the Edinburgh Photographic Society.

it may be intensified, like a wet plate, with either pyrogallic and silver, or iron and silver. Use a little more acid than for a wet plate. No red fog should appear, but should it appear it will re-dissolve in acid alum."

The explanation of this action, of course, is that a solution of pyrogallic and nitrate of silver is very unstable, and ready to deposit silver if it gets the slightest opportunity. When therefore it comes in contact with the metallic silver of the image, it begins to deposit silver there, while on the clear parts of the negative it has no action; but on attempting to apply this processs directly to a gelatine negative, dense red fog is immediately produced. But if the negative is first treated with hydrochloric acid and alum, or with hydrochloric acid alone, the intensifier acts very well; red fog appears, however, if the process be forced too far, but can be got rid of by again putting the plate in the alum bath. If hydrochloric acid alone is used, it has a slight tendency to frill, which is prevented by the addition of alum.

Our directions to those who wish to use this process are, then, as follows:—

Soak the negative for about five minutes in a bath consisting of one pint of a saturated solution of alum and one ounce of hydrochloric acid, wash with water, and then intensify exactly as you would a collodion negative. If red fog appears, again place your negative in the alum bath until the red colour is gone; this may sometimes take as much as two or three hours.

And now, it may be asked, as has been done many times before, What is red fog? Why should the treatment of the negative with hydrochloric acid prevent its formation? Is there any connection between it and the green fog so common in gelatine negatives? These are rather difficult questions to answer, but we have already made some attempts to solve them, and if we should succeed, perhaps we may have the honour of bringing our explanation before this Society.

Correspondence.

THE YEAR-BOOK.

Sir,—All who keep the useful series of Year-Books on their library shelves must have felt the same difficulty that I have experienced in finding a number for any particular year. Half-an-inch at the top of the back of the book would suffice to print the year in legible letters without interfering much with the advertising space.—Yours, &c., W. B. Woodbury.

SUGGESTION FOR A DRYING BOX.

Sir,—Mr. Hepworth's suggestion, to simplify that most difficult operation, the drying of gelatine plates, I think is an excellent one; it is simple, inexpensive, and (he says) thoroughly efficient. There is just one point I do not quite understand; will not the vapour from the "boiling solution of the soda" defeat the object, and condense on the plates? I am anxious to construct a simple drying-box, and this one of Mr. Hepworth's seems the very thing. If he would kindly put me right in my difficulty I should be greatly obliged.—Yours truly, L. Macdona.

[It is desirable that the crystallizing mixture should be entirely enclosed in a kind of screw-down copper vessel like a foot-warmer, not specially on account of any vapour, but for general convenience.—Ed. P.N.]

MR. JARMAN'S ELECTRIC LIGHT.

Dear Sir,—At the Technical Meeting of the South London Photographic Society, Mr. Jarman exhibited his new electric light, and every one present saw that he had nearly, if not quite, solved the problem of electric lighting for portraiture.

There is, however, one point which has troubled many electricians; namely, how best to soften the intensity. Perhaps the simplest and best method, when used in buildings, is to place the lamp in a large tissue paper Chinese lantern, as may be seen at the Alexandra Palace. Mr. Jarman has in a great measure conquered the difficulty by placing a small tissue paper screen in front of the arc; but I would suggest that the diameter of the reflector be doubled, and a curtain of *papier minéral* be mounted in front. Of course, if this were done, the exposure would necessarily be longer, but this is of little consequence considering that an exposure of three seconds with No. 3 stop, portrait lens and gelatine plate (12 times wet collodion), sufficed to take a portrait of the chairman at the above meeting.

At the end of the demonstration, the question was asked, whether the bichromate battery in connection with the lamp could be worked more economically by substituting one zinc and two carbon plates for two zincs and one carbon plate, inasmuch as the former is dissolved, while the latter remains uncorroded. Of course this would be the case, because it is only the sides of the zinc nearest the carbon that actually generate electricity, although both sides are attacked by the acid. A much more economical method has been proposed by my friend Mr. E. F. Herroun, of King's College, which consists in painting the outer surface of the zincs with paraffin.—Yours truly, Arnold Spiller.

GARNIER'S PHOTO-ENGRAVING PROCESS.

Sir,—Referring to a communication in last week's News, describing M. Garnier's new photo-engraving process, if any one will kindly take the trouble to refer to back volumes of the Photographic News, or to patent Nos. 1,936-61, he will find that the principal part of the details have been very fully described at that early date, and, as my patent extends also to France (and, of course, published there), I think it quite probable that M. Garnier owes to me the inception of the vital portion of his process; and, while I am writing, I may just say that if some of our recent authors and correspondents would "read up" the back pages of the News and also of the *Lithographer*, they would find to their discomfort that they had been only threshing the old chaff, instead of a new crop.—Yours faithfully, Joseph Lewis.

Proceedings of Societies.

Photographic Society of Great Britain.

The first meeting of the session was held on Tuesday, at 5, Pall Mall East, J. Glaisher, F.R.S., in the chair. The following gentlemen was elected members of the Society:—Messrs. J. H. Benham, W. K. Burton, W. J. Day, J. Duncruft, J. G. Horsey, J. M. Nisbett, G. W. Palmer, H. Waterhouse Pope, J. L. Russell, Lydell Sawyer, F. Thompson, J. F. Timms, C. Whiting, A. Youngman, Rev. A. Johnson, and Professor Donkin.

The first business was the presentation of the prize medals awarded to Messrs. England, M. Whiting, W. Bedford, J. Gale, Dixon, H. P. Robinson, Abel Lewis, Whaite, and Whymper.

The President, at the conclusion of the presentation, said that some reference was due to a number of exhibitors who, though they had not been awarded medals, had been spoken of in high terms of praise by the judges. This reference he (the President) thought was all the more necessary, because it was not in the power of the jury to accord "honourable mention" to any exhibitor. The method of award was this: each judge went round the gallery, and, without communication with each other, placed the names of those they considered most deserving on a piece of paper, which were afterwards opened by himself (the President). Of course, in the case of those about whom the judges were unanimous there was no difficulty; but there were several pictures highly approved in addition, and these had to be adjudicated upon, and this was done by voting, four votes being the minimum to secure a medal. Now, he thought it was only fair that those exhibitors who had nearly reached this standard should be named, and accordingly he had much pleasure in referring to the excellent work shown by Mr. T. M. Sutcliffe, Miss Miles, Capt. Brownrigg, the School of Military Engineering, Mr. A. Reynolds, Mrs. S. G. Payne, Mr. Payne, Mr. F. Schwabe, Mr. H. Pointer, Messrs. Hills and Saunders, Mr. J. S. Catford, Prof. W. H. Donkin, and

Mr. H. Axtmann. He also had to mention the fact that Mr. Seymour Conway had exhibited pictures to which a medal would have been awarded had not Mr. Conway been on the Hanging Committee. He might say that this Committee had executed their difficult task with the utmost care. It was, of course, impossible to please everyone, and the plan they had proceeded on was to hang the pictures so as to secure the greatest harmony of effect as a whole. He had to confess that it was with some surprise he had received two letters complaining of the catalogues. Now, it was impossible to begin printing the catalogues until the pictures were hung. This was not completed until Friday, and then the jury had to make their inspection. This took a little longer than usual, and when he (the President) left on Friday evening, he had some misgiving as to whether the catalogues would be ready on the following day. Mr. Cocking, however, stuck to his work throughout the night, and then got the matter into the printer's hands, and by twelve o'clock on Saturday there were fifty copies in the room for the use of the press. Under the circumstances, the errors were wonderfully few, and these were, of course, corrected in the subsequent editions.

Mr. Jones explained, as the writer of one of the letters, that he would not have complained if, after writing both to Mr. Cocking and the President, pointing out an error, he had received an answer. Mr. Jones went on to say that he did not expect the Hanging Committee to please everybody, but his pictures had been hung on the back of a screen where they could not possibly be seen by anyone, and, under these circumstances, he would have preferred to have had them returned. As a matter of information, he would like to know whether any preference was extended to members of the Society in regard to the hanging of the pictures of equal merit.

Mr. Vernon Heath said he should like to bring before the Society a matter which he believed had been talked about outside, and that was in respect to the time for sending in pictures. He had been told that those who sent in their pictures punctually got placed worse than those who sent in at the last moment.

The President said, in answer to Mr. Heath, that allowance was always made for those pictures which, coming from a distance, arrived late through delay in transit.

Mr. Sebastian Davis said that, as a member of the Hanging Committee, he could state that their desire was to arrange the pictures with an eye to the general effect. They also thought it was only right to select, if possible, leading pictures, which illustrated some advance in photography during the year, and place them, without reference to whom they might belong, in a prominent position. It would be observed that, as nearly as could be, portraiture was placed on one side of the room, and landscapes on the other. He might say that it had been often suggested that the works of one man should be placed together; but personally he was totally opposed to it, as a mass of pictures, all framed alike, would be unsightly, and destroy the balance of effect. In answer to Mr. Jones, he would also say that where there were pictures of equal merit, the claims of a member would not be overlooked; but even here their claims would be subordinate to the general effect.

The subject then dropped, and votes of thanks were passed to the Judges, the Hanging Committee, and the Assistant Secretary.

The meeting then adjourned.

South London Photographic Society.

The Annual Technical Meeting of this Society was held on Thursday, Nov. 3rd, in the large room of the Society of Arts, Adelphi, Rev. F. F. Statham, President, in the chair.

The Chairman said that a little business would have to be transacted before the technical part of the evening commenced.

Mr. H. Normington was then duly elected a member.

The nomination of officers for election at the next meeting for the ensuing year then took place, the only alteration likely to take place being in the Committee. The name of Mr. W. Cobb was proposed by Mr. E. Cocking.

The Chairman then announced, as the subject for the December artists' competition—"Innocence."

A letter from Captain F. W. Turton was then placed before the members, but, being a matter not within the scope of the Society, it could not be entertained.

The Secretary called attention to the forms sent to him for distribution amongst the members for sending pictures to the forthcoming Manchester Exhibition. Tickets had also kindly been sent by Mr. A. Standing (Hon. Secretary of the Balloon Society of Great Britain) for distribution for the meeting on Friday, Nov. 11th. Subject: "Balloon Photography."

The Chairman stated that the Annual Dinner of the Society would take place on Saturday, Dec. 3rd, at the Holborn Restaurant. Tickets 5s. each.

Mr. W. Brooks was then elected Technical Chairman.

The Secretary exhibited first, an instantaneous shutter from Messrs. Harvey, Reynolds, and Co., of Leeds. This is an ebonite shutter: it is worked by means of a flap which, when raised, releases a drop shutter, and thus an instantaneous exposure is made; by keeping the flap at right-angles, the drop is not released, and any length of exposure can be obtained.

Mr. Werge then exhibited a portable lantern, which, when erected, was of a triangular shape. The light was obtained from a permanent night-light; the medium through which the light passed was close silk, there being sufficient draught at the bottom for the light with a ventilation at the top. It certainly folded up into a compact little parcel.

Mr. Henderson then showed an exceedingly ingenious apparatus for filtering gelatine emulsion. It consisted of a glass globe; a hole at the bottom being covered with three thicknesses of wash leather; a hole at the top for pouring in the emulsion, and an india-rubber tube inserted in another part of the top, with a ball attached; by pressing the ball the air forced the emulsion rapidly through the leather, causing thorough filtration. Mr. Henderson further stated that by having balls of different sizes, only sufficient air was introduced to cause enough emulsion to pass through to coat a certain sized plate. Thus it was both a filter and plate-coater at the same time.

Mr. Harrison exhibited an ingenious little pocket camera for plates two inches square; it consisted of three chambers—one for plates, the middle one being for the camera, and the third one for exposed plates. By one simple movement underneath, the plates were moved along from the first chamber to the second, and when exposed, on to the third; it was constructed to take one dozen plates.

Mr. Henderson said he had used the camera in Paris on street views, &c., with success.

Mr. Cowan showed two boards for cutting glass plates; the one for cutting glass always in the centre. This consisted of a square frame working on fixed pivots from the centre of the two sides. Thus, if a plate is put in, and the frame moved round, the glass is gripped, and by means of a hinged board brought down on to it; the centre is thus obtained of any sized piece of glass. The second board was similar to one shown before by Mr. Cowan, with the addition of a sliding gauge to cut odd sizes in photographic plates. Mr. Cowan also showed an arrangement for copying, the principle being somewhat similar to the first board for cutting off the rays of light, except the part desired. He also showed, on behalf of Messrs. Marion and Co., a pocket camera, somewhat after the pattern of Mr. Harrison, with the exception that the plates in this case came from a box travelling along the bottom of the camera, and also the addition of a finder, which would be very useful.

Mr. W. Brooks then showed Mr. Jackson's instantaneous shutter, working either with a trigger at the side, or with pneumatic power. Mr. Brooks said he worked the shutter between the lens and camera, by screwing the shutter on to the flange in the camera, and having an extra flange on the other side of the shutter—if a large shutter was used. By means of adapters, any sized lens could at once be applied.

Mr. J. F. Shew exhibited a portable lantern. When erected, it was about twelve inches high, and the sides square, about four inches. It was constructed of hard cardboard and two thicknesses of ruby paper mounted with ruby medium; at the back was a reflector, consisting of a silvered metallic paper. The light was obtained from a hard material that did not give off any smoke. Mr. Shew also exhibited an instantaneous shutter.

Mr. Archer Clarke then showed an apparatus for pressing gelatine emulsion, consisting of an ordinary brawn presser, with handles each side for suspending it over any vessel.

Mr. Foxlee passed round several of Mr. Galton's composite portraits.

Mr. E. Cocking stated that as they had not the *modus operandi* how the pictures were obtained, it might not be amiss if he stated what he knew about them. A dozen negatives of different people in one station of life were printed one on top of the other—of course, the heads being of one size—and the result was a composite portrait. The idea was very useful, as showing the different cast of face in different classes of humanity.

Mr. A. J. Jarman then proceeded to give a *resumé* of electric lighting, from Sir Humphry Davy down to the present time. Mr. Jarman then explained his own apparatus (this having been already done in these columns, it is needless to repeat here), and proceeded to take some portraits by its aid; the results showing that, of course, with suitable reflectors and the proper appliances, a good portrait could be obtained.

The Chairman, after a few remarks, asked for a hearty vote of thanks to be passed to those gentlemen who had kindly attended and exhibited that night. This having been done, the Chairman said he was asked to call attention to the annual dinner of the Photographic Club to be held on November 16th, at Ashley's Hotel; also to the Benevolent Society—the Photographic Society of Great Britain having again placed their Exhibition on Friday, November 11th, at their disposal. The Exhibition would be open from 7 till 10 p.m., tickets sixpence each, for the benefit of the Institution.

The meeting then adjourned till December 1st, the annual meeting.

Edinburgh Photographic Society.

The twenty-second annual meeting of this Society was held in 5, St. Andrew Square, on Wednesday, the 2nd inst., Mr. John Lessels, President, in the chair.

The minutes having been read, approved, and signed, the following gentlemen were elected ordinary members:—Messrs. Frank St. Ogger, John Calder, Alexander Drew, John Donaldson, Robert Smith, William Morrison, George A. Wilson, and A. B. Stewart.

The Secretary (Mr. M. G. Dobbie) and Treasurer submitted their reports for the past session, which were considered highly satisfactory, and were passed unanimously.

After the reports were passed, the meeting proceeded to elect office-bearers. All those gentlemen who held office during the past year were re-elected with the exception of Mr. F. P. Moffat, who had resigned. Mr. W. T. Bashford, Portobello, was elected corresponding secretary in his stead. The following gentlemen were elected members of Council in room of the four who retired by rotation:—Messrs. James Jameson, Marshall Wane, William Dougall, and John Simpson.

Mr. Cosmo I. Burton then read a paper entitled "Mercury Intensifiers," the joint production of himself and Arthur P. Laurie (see page 536).

At its close, Mr. J. M. Turnbull thanked Mr. Burton for the interesting paper which he had read, and which, he remarked, displayed a very great amount of research in the matter. With regard to intensifying, he thought it should seldom be required with gelatine negatives, and then only as a means of remedying an error, either from over-exposure or insufficient development. The usual way of intensifying with bi-chloride of mercury was to bleach the image with the mercury, and then flood the plate with a solution of ammonia; but, as a rule, he did not much care about mercury intensifiers, as negatives intensified by their means were very unstable. There was a formula of gelatine iron and acetic acid, combined with silver and citric acid, given by one of the makers of gelatine plates, which was very much superior to mercury.

Mr. F. P. Moffat agreed with Mr. Turnbull in regard to the iron and silver intensifier. He thought there was an insufficient control over the density when mercury was used, whereas the iron and silver acted gradually on the plate, and could be stopped at any moment.

Owing to the lateness of the hour, Mr. W. H. Davies moved that the discussion should be adjourned until next meeting; this, he further remarked, would also allow members an opportunity of reading Mr. Burton's paper, as it was impossible to grasp the whole of it on only hearing it once read.

This motion being adopted, a vote of thanks was passed to the office-bearers and members of Council for their labours during the past session. Mr. Moffat passed a book round the table entitled "Modern Dry Plates," or "Emulsion Photography," edited by Mr. Baden Pritchard, from the German of Dr. Eder.

A vote of thanks to the President terminated the proceedings.

Glasgow Photographic Association.

A meeting of this Association was held in the Religious Institution Room on the 3rd inst., at eight o'clock p.m., Mr. John Parker, President, in the chair.

The minutes of the last meeting were read and approved of, and the following gentlemen were elected members—viz., Henry Steven and William J. McIlwrick.

The only matter to be brought before the meeting was a paper by Mr. H. Reid on "Some Experiments with his Paper Lantern," but through indisposition Mr. Reid was unable to be present; his results, however, were placed on the table, and may be summed up as follows:—

"The plates experimented upon were Gray's, and were exposed at a uniform distance of twelve inches; the developer used in every instance was the same, and with the exception of No. 6 (which was exposed for one hour), all were exposed for one half-hour.

No. 1. One thickness of ruby glass and one thickness of oiled ruby paper.—Result: a faint print.
No. 2. Four thicknesses of oiled ruby paper.—Result: no print.
No. 3. Two thicknesses of oiled ruby paper.—Result: a print.
No. 4. Four thicknesses of oiled ruby paper with larger burner.—Result: a print.
No. 5. Same as No. 7.—Result: no print.
No. 6. Same as No. 7 and 5.—Result: faint print.
No. 7. Same as No. 2, 5, and 6.—Result: no print.

With the exception of No. 4, the burner employed was the same—viz., a "rat-tail" burner.

It was therefore made evident that Mr. Reid's lantern gives a perfectly safe light when glazed, so to speak, with four sheets of paper. The lantern was not exhibited at the meeting, being familiar to most of the members, and having been used on a former occasion.

The remainder of the evening was spent in general conversation and discussion, stimulated by the question found in the "question-box" when opened.

Dundee and East of Scotland Photographic Association.

The second ordinary meeting of the above Society was held in Lamb's Hotel, Reform Street, on Thursday evening, November 3rd, Mr. J. C. Cox, President, in the chair.

The Hon. Secretary read the minutes of the last meeting, which were approved and confirmed.

The following gentlemen, having been duly proposed and seconded, were admitted members of the Association—viz., Dr. Tulloch, Tay Street, and Mr. J. S. Powell, Perth Road.

The President, in his inaugural address, remarked upon the large increase of members during the past year. The Association had much more than doubled its numbers, and he (the President) congratulated the Society upon the quality, as well as the quantity, of the increase. He was glad to be able to say that the arrangements for the Exhibition were progressing, and that the Committee would report next month: also that several members had promised to contribute papers, and that these popular evenings would enliven the winter session.

Mr. W. D. Valentine, V.P., most kindly offered the use of a large number of slides for a lantern entertainment, open to members and friends; and Mr. Macdougald, who also promised the use of apparatus, was appointed, with the Hon. Secretary (Mr. C. Johnson), to make arrangements for a meeting on Thursday, the 17th inst. Mr. A. Watt was proposed a member of Council.

The Hon. Secretary read a letter from Captain Turton, Italy, on the want of reliability in the commercial gelatine plates.

Mr. W. D. Valentine exhibited an instantaneous drop-shutter, the improvement of Mr. Lowdon, Reform Street, by which he claims that, by a certain shape in the opening of the shutter, a longer exposure is allowed to the edges than to the centre of the picture, which is an obvious advantage.

A vote of thanks was passed to Mr. Valentine for his explanation.

Several excellent photographs, as contributions to the portfolio and album, were received from Messrs. Geddes, Donald, and Roger. A parcel of forms was received from the Manchester Photographic Society, also the *American Photographer* from Mr. J. T. Taylor, for which thanks were voted.

A vote of thanks to the Chairman closed an interesting meeting.

Thursday Evenings for Photographers.

At the meeting on the 3rd inst., the chair being occupied by Mr. J. A. B. Hall.

A discussion took place on the merits and demerits of Jarman's electric lamp, just exhibited at the Society of Arts.

Mr. Henderson showed the alabastrine pictures spoken of by him at the last meeting, and said he thought that negatives intensified with mercury alone would be found to be more permanent than when iodine was used.

Mr. H. Normington showed an excellent negative of the balloon which burst at the Alexandra Palace on the previous Saturday, taken just as the balloon burst.

Mr. Henderson showed an emulsion filter, and Mr. Harrison his bijou camera.

The Photographic Club.

The annual general meeting of the Photographic Club was held in the Club Room on Wednesday, Nov. 2nd for the purpose of receiving the reports of the Committe and Treasurer for the past year, Mr. P. Mawdsley occupying the chair.

The report of the Committee congratulated the members upon the continued success of the undertaking, there being no less than seventy-three members who had paid their subscriptions for the current year. Another subject of congratulation was the Treasurer's report, showing a considerable balance (£46 3s. 4½d.) in favour of the Club. The report further recorded the dinner, on the 3rd of last December, under the presidency of the Rev. F. F. Statham, at which upwards of sixty sat down, and a *soirée* and ball in aid of the funds of the Photographers' Benevolent Association, at the City Arms Tavern, on the 9th Feb., attended by upwards of one hundred ladies and gentlemen, the proceeds amounting to £11 17s. 3d.

The reports having been adopted, the meeting proceeded to elect officers for the ensuing year, the result being that the old officers were all re-elected.

Votes of thanks were passed to the officers for their services during the past year, and to the Chairman of the evening.

Talk in the Studio.

A lady rashly volunteered to act as subject for the illustration of posing at the Photographers' Convention the other day, and was obliged to hear the lecturer pointing out, in a loud voice, that her nose and all other features were too large, and needed a subdued light, and that her square shoulders must be concealed by a three-quarter view.—*Boston Paper*.

The Exhibition of Photographic Appliances.—In connection with the course of Cantor Lectures which will be delivered by Captain Abney, F.R.S., on "Recent Advances in Photography," in January and February next, it is proposed to hold, in the House of the Society of Arts, an Exhibition of Photographic Appliances. The dates of Capt. Abney's lectures are January 30, February 6, 13, and 23. The Exhibition will be kept open from January 30 till about the end of February, and will be of a technical character, and it is not, therefore, desired to collect photographs of artistic merit only. The following are among the principal classes of objects sought for exhibition:—Apparatus—cameras, lenses, tents, instantaneous shutters, slides, sensitometers, lamps (intended specially for photographic purposes), enlarging apparatus, printing and mounting apparatus, &c.; photographic materials; illustrations of new processes—negatives and prints produced by new or special processes; appliances used in reproductive processes—specimens of illustrations produced by such processes—specimens of historical interest, as illustrations of old processes; lighting—models illustrative of characteristic features in the construction of glass houses, methods of fixing glass without putty or similar material, arrangements for the production of artificial light for photographic purposes. Any person wishing to exhibit any of the above is requested to communicate with the Secretary of the Society, who will supply printed forms of application for space, and will be glad to give any further information required. It is hoped that arrangements may be made for showing the actual working of some of the more recent processes.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ We are compelled once more to postpone "By-the-Bye" from press of matter.

⁂ Photographic Residues and Waste.—We have selected two papers by (1) Selimo Bottone, and (2) Hadah.

J. W. Browning.—We fear your communication is too much of an advertisement to appear in our Correspondence column.

S. Whitlaw.—You need not be afraid; "Modern Dry Plates" will post you up perfectly in the matter. You will be able to understand it very well, even with the "smattering of chemistry" which you say you only possess, for the whole subject is very clearly set out.

M.—You are quite right in your inference that we do not understand Russian; but we know a hawk from a hand-saw.

Up to the Scratch.—Curd soap is generally kept in stock at the London oil and colour shops. It is a tallow and soda soap, and is generally hard, clean, and well made.

Alf. Poulton.—1. See page 241 of the present volume of the Photographic News. 2. Probably you might make a beginning with £100. 3. As long as the motive power is sufficient, it makes no difference whence the power is obtained; in other words, you will only be able to drive a very small machine with the power exerted by one man working on a treadle. It is, however, unnecessary for you to trouble yourself about machine work until you can produce good work at a hand-press.

G. Baker.—It will doubtless answer very well; but if the walls are at all damp, line the cupboard with thin sheet zinc. That known as No. 6 costs about five farthings a square foot.

J. Jordan.—1. We should prefer the first; but much depends on circumstances. 2. Carefully study Dr. Eder's book on the subject.

A. F. A.—The operation is somewhat uncertain, so you had better first make as good a transparency as you can; after which the negative may be soaked in a dilute solution of potassium cyanide. Begin with about two grains to the ounce, and increase the strength gradually.

J. W.—1. About 10 ounces. The paper assumes a general knowledge of the subject on the part of the reader. See answer to J. Jordan.

D. S. Jones.—1. It should not, under ordinary circumstances, exceed 110° F. 2. Any dealer in photographic goods will supply them.

Silver.—Yes, but the results are not nearly so satisfactory.

J. S. W.—1. Add four grains of citric acid to each ounce of the sensitizing bath. 2. Consult our advertising columns. 3. Reduce the silver, and make a fresh bath.

A Subscriber.—1. A wide-angle rectilinear or portable symmetrical of short focus. You will probably require a camera with a rising front. 2. Winsor and Newton, Rathbone Place, London; but we cannot tell you the price.

W. E. D. Jones.—1. You have made excellent progress, and if you continue to work in the same direction you will rapidly advance towards a high degree of excellence. 2. It is necessary to interpose a condenser of short focus between the light and the negative, and the image of the light formed by this condensing lens should correspond in position with the optical centre of the objective. A quarter-plate portrait lens is well adapted for your purpose. 3. Varnish the back of your plate with matt varnish, and carefully stump with blacklead powder on the defective parts.

Nemo.—Be careful to avoid too much light in the preparation of your plates: it being generally better to do a thing correctly at first, than to tinker up a bad result by subsequent processes. 2. Read "Gelatino-Bromide in a Nutshell" in our current Year-Book.

L. Farmer.—Only under the special circumstance to which you refer.

Ad. Egois.—Thank you; next week.

H. S. Bootle.—No. 2 is the better photograph; but unless you send the original for our inspection, we cannot judge as to the likeness.

Progress.—This subject will be thoroughly treated of in the next "By-the-Bye."

Anti-Humbug.—It certainly looks like an imposture, or, at any rate, a fraudulent exaggeration; but it would be unjust to denounce it without clear and certain evidence.

Varnish.—If you cover it with a thin film of albumen, your difficulty will disappear.

Ben Jarvis.—Nitrate of soda is not adapted for the purpose, as it absorbs moisture from the air.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1211.—*November* 18, 1881.

CONTENTS.

	PAGE
A Drop Shutter Passing Through the Lens Mount	541
Light in the Dark Room	541
A Photographic Experiment with Swan's Incandescent Light	542
By-the-Bye.—On Tripods	543
Odd Jobs. By the Author of "Looking Back"	544
Alcoholic Solution of Tannic Acid for Preventing Frilling. By A. J. Jarman	545
Notes	546
The Swan Collection of Photographs at Newcastle-upon-Tyne	547
Topics of the Day.—Photographic Residues and Wastes: What is Worth Saving, and How to Save It. By Selimo Bottone	548
Balloon Photography. By Walter B. Woodbury	549
Correspondence	550
Proceedings of Societies	551
Talk in the Studio	552
To Correspondents	552

A DROP SHUTTER PASSING THROUGH THE LENS MOUNT.

Mr. W. D. Valentine, of Dundee, has forwarded for our inspection a very simple and effective shutter constructed of thin sheet metal. The actual drop piece is represented by figure 1; and by making the opening A of the shape indicated by the drawing, somewhat less exposure is given to the central portion of the plate than would be the case if a plain rectangular opening were adopted. This drop piece slides in a flat tube built up out of similar sheet metal, a pair of circular holes corresponding to the maximum working aperture of the lens being cut in this flat tube, and the whole arrangement fits into a slot which must be cut through the lens tube just in front of the diaphragm guide; a pair of arc-like pieces of brass, which are soldered on to the apparatus, serving the double purpose of keeping out light, and of ensuring that the apparatus shall always be so placed that the circular apertures correspond with the central portions of the lens mount.

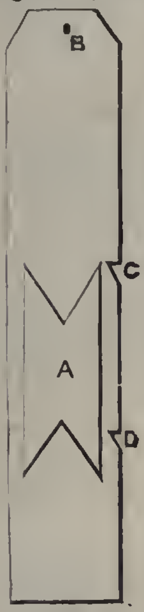


Fig. 1.

The arrangement for releasing the drop is neat, and well worthy of note. Figure 2 represent it in section. The three interior lines represent a sectional view of the flat tube and the drop, while the outer shaded portion stands for a light metal frame which can slide across the apparatus; but which is held towards the side A by the spiral spring. Under these circumstances, the internal stud shown near B presses on the drop, and may support it either at the point C, figure 1 (half-cock), or at D, figure 1 (full-cock). Pressure on the end A of the sliding framework serves to release the drop.

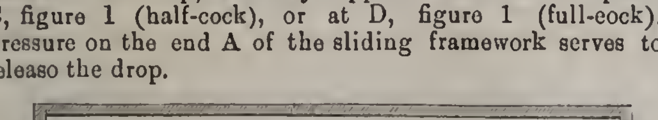


Fig. 2.

In a communication to us, Mr. Valentine says:—"To use the shutter, a slot has to be cut through the tube of the lens close to the diaphragm; then the shutter is inserted in the opening, the small flange keeping it in place, and preventing light getting in. To focus, press the spring slightly, at same time drawing up the drop till it catches and leaves shutter open. To expose, draw up the drop to its last catch. A very slight pressure on spring A releases shutter, which falls and shuts itself; a small piece of lead on B prevents any jar when the drop falls. We generally carry several drops with different sizes of openings, using them according to light, subject, &c. I have tried a great many of the instantaneous shutters sold, and have made several, but have found none so reliable as this one. I have to thank Mr. G. Lowden, the optician here, for the great trouble he has taken, and cleverness he has shown, in putting the very rough ideas I gave him into shape; he deserves the full credit, if any, of the affair."

It will be well for our readers to bear in mind that it is generally undesirable to cut the lens tube for such a shutter as that of Mr. Valentine, it being a much preferable course to send the lens to the maker and get him to make a special tube with the required slot in it. On one occasion we required such an extra tube for a lens by one of the leading opticians, and the extra tube was in our hands four hours after we had taken the lens back to the maker.

◆

LIGHT IN THE DARK ROOM.

The subject of "light in the dark-room" is one which crops up periodically. We have recently had a note from one of our correspondents advocating the use of a much stronger light than that generally permitted in the room in which dry plates are worked.

As opinions seem to vary so very much with regard to this point—some advocating the deepest of deep ruby light, and little of that, and some permitting a flood of orange light—the question may be once more worth looking into.

Why does such a divergence of opinion exist? We believe it is due principally to two reasons. The first of these is to be found in the fact that the sensitiveness of gelatine plates varies considerably, and that the sensitiveness to the red end of the spectrum varies much more than the general sensitiveness, even when bromide of silver alone is used, but still more when iodide and chloride are in the films.

With pure bromide the sensitiveness to the red end of the spectrum seems to increase in a greater ratio than the sensitiveness to the blue and violet ends as the rapidity of the emulsion is increased.

Another reason is undoubtedly the different standards of excellence which different operators have. What is meant by a good negative? How many photographers make a habit of getting gelatine negatives which, when placed film downwards on a sheet of white paper, show *no* fog or discolouration in the shadows? Yet such negatives can undoubtedly be got, but not, we venture to say, by those who, using very sensitive films of bromide of silver, change their plates and develop in a bright orange light.

We have seen it stated by some gelatine workers that they change and develop their plates in a light similar to that used for collodion. A little reflection will show that such a light, unless far more than safe for collodion, cannot possibly be safe for gelatine, because, even supposing the latter to contain a considerable amount of iodide so that it is not proportionately more sensitive to the red rays than the former, still one-tenth or one-twentieth part of the time which will fog the collodion would fog the more sensitive dry plate.

During the summer months, when we remember to have heard the usual light used for collodion work advocated for gelatine, we made a few experiments with the sensitometer with the following object. We wished to bring home to our minds in a forcible manner the safety, or the reverse, of certain lights, by establishing a comparison between sensitive gelatino-bromide films used in the dark room, and albumenized paper used in varying amounts of white light. We wished to do this, simply because it seemed to convey something tangible to us with regard to the effect of coloured light upon the gelatine film, to be able to say of a certain dark room, "This is as if we were working albumenized paper in an ordinary room lighted with large windows." In working albumenized paper, we know almost instinctively, whether the light we are in is safe or not, because we have been used to see any effect that is produced upon the paper immediately; but it is not so with the sensitive film, where we do not see the result till development has taken place.

We worked in an ordinary collodion dark room—that is to say, one which was illuminated by several square feet of orange glass, with ordinary diffused daylight beyond it. In an inner room the light of which was above suspicion, we placed a highly sensitive bromide of silver plate under the sensitometer screen in a printing-frame. We then brought this forward to the same position as that in which we would have worked a collodion plate, and left it for a certain time, and afterwards developed in an inner room. We then printed pieces of albumenized paper under the same screen, noticing how long it took for the same figures to appear as in the case of the plate. The conclusion that we came to was, that working a pure bromide film of the highest degree of sensitiveness in such a light as we have described, was just about equivalent to working albumenized paper in a full blaze of summer sunlight. Either operation is just possible—that is to say, by the exercise of considerable dexterity, paper may be placed in the printing-frames, and taken from them, in full sunlight, and gelatine plates can be placed in the slides, removed from them, and developed in a dark room, such as that just described; but the proceeding is not one to be commended in either case. We have, under exceptional circumstances, developed rapid plates by the light of an ordinary candle, and got what would be called clear negatives, but it was only by great care and much "dodging."

In judging whether the light is safe or not, it is by no means a sufficient criterion to develop a negative, and try to see whether it is distinctly fogged or not. A negative which, in reality, is considerably fogged, will pass for a clear one if it stand alone. Let one half, however, have been protected from light, and a difference will be made very apparent.

Here is a farther experiment we tried. Having exposed several plates, and having placed several unexposed plates in printing-frames under sensitometer screens, we placed together, for various lengths of time, in front of the orange window, an exposed plate and a plate under the actinometer. We then developed these together in ruby light. The negatives standing alone would have passed as clear negatives, although the plates which had been beside them under the sensitometer all showed several figures, one the first five.

We now placed in the orange light for the same length of time as the last-mentioned one, another exposed plate, but this time we protected half of it by wrapping brown paper round it. On developing, there was a distinct difference between the two halves, and the one which had received the light, placed as it was in close juxtaposition with the perfectly clear half, looked very inferior. The result of the experiments which we made in comparing gelatine films with albumenized paper was roughly as follows:—

Working the most rapid dry plates at two or three feet from a window of several feet of orange glass, illuminated by bright diffused daylight, is equivalent to working albumenized paper in the full blaze of sunlight. With several square feet of single ruby glass it is equivalent to working albumenized paper in deep shade outside. With one square foot of ruby glass it is equivalent to an ordinary well-lighted room—that is to say, that this may be considered a safe light to develop in if a little care be taken. With a square foot of one thickness of deep ruby glass and one of orange, it is equivalent to the darker corners of an ordinary room; that is to say, it takes five to ten minutes for any effect to be brought about, so that such a light may be considered quite safe for manipulating and developing plates, but is barely safe for the manufacture of emulsion, which is best done by artificial light. We know of no light in which development can be comfortably conducted, and which will not affect a very sensitive plate in from ten minutes to a quarter of an hour.

It will be seen that, at least with a pure bromide of silver film, we do not consider it by any means advisable to use orange light in the dark-room before the plate has been covered by the developer. It has, however, been pointed out that if the plate is in the developer, and the image has begun to make its appearance, a considerably greater amount of light is allowable, and this we have at various times re-asserted. We made one experiment to prove it, in the room which we mentioned before—one illuminated with several square feet of orange glass, using the same films which had been affected with only a few seconds of the light, but carrying on all the operations in the inner room, until the image began to make its appearance on the film, when we covered half the developing dish with a black card, and brought it into the orange light, and left it there for one minute till development was completed. In this case we could not perceive any difference between the half which had been protected, and that which had not.

A PHOTOGRAPHIC EXPERIMENT WITH SWAN'S INCANDESCENT LIGHT.

Some trials we have recently made with Swan's incandescent electric lamps give results that may possibly interest our readers. We employed throughout an electric stream of the same energy—that generated by thirty Grove cells—and, as the whole experiment lasted but an hour, it may be assumed, for all practical purposes, that the strength of the current was uniform throughout.

We made use of four lamps in all, supplied promiscuously from Newcastle, their resistances being respectively—No. 1, 67 ohms; No. 2, 59 ohms; No. 3, 58 ohms; No. 4, 52 ohms. Our object was to ascertain their actinic power upon a gelatino-bromide film, individually, collectively, and in groups. To do this, we exposed a gelatino-bromide film to the action of the light at a distance of fourteen feet, the sensitive film being placed behind a screen more or less transparent. The screen was divided into small squares, each representing different thicknesses of fine tissue paper. Thus, square marked No. 1 represented one thickness; No. 2, two thicknesses; No. 3, three thicknesses, and so on, the last square being almost opaque, and representing twenty-five thicknesses of tissue paper. The exposure in every case was ten seconds; the distance of the film from the light, or lights, always fourteen feet, and the number of cells thirty. The development was confined to two minutes exactly, an oxalate developer of normal strength being employed.

Developer.

Saturated solution of oxalate of potash ... 3 parts
Saturated solution of protosulphate of iron ... 1 part

Result of First Experiment.

	Number of squares through which the light penetrated.
Group of four lamps (Nos. 1, 2, 3, 4)...	... 13
,, three ,, (Nos. 2, 3, 4) ...	... 15
,, two ,, (Nos. 3, 4) ...	... 19
,, one ,, (No. 4 low resistance)...	23
,, one lamp (No. 3, high resistance) ...	20

As it was a matter of difficulty to judge the exact square, or number, printed through, the mean result of three observers or readers was taken. So that the development should be the same throughout, all plates were developed simultaneously in the same dish.

The result may not permit us to estimate with scientific accuracy the value of the lights under *the above conditions*, but it proves practically, (1) that the amount of light given off by the four lamps is less than that given by three, and that the electricity is employed most economically for lighting when only one lamp is used; and (2) that, at any rate, in the conditions described, a comparatively low resistance lamp gives more light than a comparatively high one.

In our second experiment we estimated the actinic power of single lamps, when one or more were in circuit, the photographic arrangements being the same.

Result of Second Experiment.

	No. of squares through which the light penetrated.
One lamp, No. 4 (only one in circuit)	... 23
One lamp, No. 4 (two in circuit) ...	... 18
One lamp, No. 4 (three in circuit) ...	... 14
One lamp, No. 4 (four in circuit) ...	... 9
Arc light (with thirty cells) ...	upwards of 25
Ordinary fish-tail burner (burning 5 cubic feet per hour)	 7

The result here is interesting in showing the comparative strength of the lamps by themselves, and to what extent the light, so to speak, is "turned down" by bringing another lamp into circuit. As our screen was only graduated as far as 25, it was impossible to estimate the comparative value of the arc light, for it went above this degree; while a low resistance Swan lamp only gave as far as 23. This last lamp—No. 4 in the series—was the one always tested, and, therefore, the results shown may be considered the most favourable. The result given by a good fish-tail burner permits us to make some comparison between gas and the Swan light at its minimum.

By-the-Bye.

ON TRIPODS.

It is because we have no intention of speaking about camera stands in the studio, but only of those out of doors, that we have placed the heading "Tripods," above this article. In the studio, it is rare indeed to find the tripod employed at all as a stand; popular favour now-a-days runs in the direction of a heavy solid stand that moves slowly and smoothly upon castors or small wheels. Some photographers have iron castings to work upon, and others a massive structure of teak or mahogany; in any case the stands used are generally very different to those employed in the field.

The landscape photographer, whether he be professional or amateur, whether he is securing pictures with a view to profit, or to his own gratification, is always actuated by the same motive, to get the best return for his trouble. It is true, the professional photographer usually carries a heavier equipment with him, and has more time to spend over his work; but still, like everybody else, he wants to get through his labours with the least trouble, and to make the best use of his time, and as in the case of his brother, the tripod has much to do with the success of his work.

We have travelled with a camera in various countries and with various kinds of tripods. We have employed high stand, low stand, no stand. We do not say our experiences have solved the difficulty, but they have made us closely acquainted with it, and an obstacle well met is half surmounted. It is one thing to know what one wants, and another to get it; at the same time, to be thoroughly cognisant of the end to be attained is a step in the right direction.

A tripod should place the camera on a level with the eye. There are very few tripods that do this; as a rule, the eye has to be lowered considerably in order to focus. Only those who have repeatedly carried a camera out of doors know the value of this dictum. You are walking along by hill or dale in search of pictures for the camera. Suddenly, at the turn of the road, a perfect little gem presents itself. There are some craggy boulders, and a cluster of thistles by the roadside, that will make an admirable foreground to the quaint homestead beyond, a brown thatched farm with many-gabled roof and red brick windows of Queen Elizabeth's time, that stands at the foot of a grassy slope. Some spreading oak trees are on the right, and beyond, towards the left of the picture, is the soft outline of a range of blue hills. But when you have fixed the camera on the tripod, and stoop down to focus, behold! half the beauty of the scene has disappeared. You are too low, you find, so you climb the bank by the side of the road, and focus again. Confound it! the foreground has now gone, and you have to bring down the whole of your machinery once more. There are some more boulders further on, and a clump of brambles, which will make even a better foreground. "Come on!" you cry to your patient companion, and between you the apparatus is once more set up for work. But this time, it is worse still; the lichen-grown porch of the farm is hidden to view, and you cannot see that fantastic roof so well, which first caught your eye. It is no longer the charming picture you first sighted.

What is to be done? At first you argue that there must be at least a dozen points that are suitable; so you walk up the road and down the road, only, however, to come to one conclusion, that the point whence you first sighted the farm is by far the most appropriate.

It will sometimes happen, if you have not marked the place, that you are unable to find this identical spot again, and, after half-an-hour's delay, will give up the scene in disgust; and all because you could not get your lens to see exactly what you saw. It is surprising indeed how very rarely—even if you can place your camera where you like—you are able to improve upon the view that first takes your fancy; and this, indeed, is only natural, because, of course, you do not halt until the impression created upon you is a very marked one.

Being but ordinary human beings, and endowed only with one pair of orbits at a fixed height from the ground, it is possible, of course, only for us to see pictures at that height, unless, indeed, we choose to walk about half doubled up. And yet this is what we should do, in order the better to look out for camera pictures, if provided only with a tripod that raises the camera but four feet or so from the ground. It is surprising what a difference a few inches make, and the difference is not to be compensated for by employing a swing-back, throwing the lens out of the centre, or any one of the devices which ingenious camera-makers furnish us with.

It is only the photographer who has made excursions from home who can fully appreciate what we say on this head; in many cases it is possible, we are ready to admit, to set up the camera tolerably well elsewhere, and even to make a good picture of the object from a point much below the eye; but it is work that never gives entire satisfaction, since you have not had your own way in taking the photograph. You have not secured that picture which caused you to come to a full stop; you have not done full justice to your subject.

We have said that we have travelled with various tripods, and if you cannot take one with you that will place the camera pretty well on a level with the eye, our advice is to choose a low and steady one. Vibration, as everybody knows, is the bane of every tripod, and unless the latter is exceptionally well constructed, this defect, obviously, is greater in a high stand than a low one. No stand at all, we once travelled with in the Tyrol—after a fit of disgust over a certain alpenstock tripod that turned out an utter fraud—but this experiment we are bound to admit was unsuccessful. So much time was lost in seeking a support, that the operation of photographing became a most uncertain business, and it not unfrequently ended by employing the moss-grown boulder or quaint stone wall we had chosen for foreground as the pedestal for the camera. But a pigmy stand we constructed from an artist's tripod stool was by no means a failure, for we usually found a heap of stones, a bank, or other convenient resting-place for it. The camera was always steady, and this is more than we can say of any other stand it has been our lot to carry.

We have never been able to adapt the mountain pole so successfully to the tripod. On one occasion we employed a pole split in three, which for mountaineering had a brass point or cap to receive the three iron feet, and a brass band in the centre, keeping the legs firmly together. This was a very good tripod, quite high enough, tolerably steady, and well adapted to glacier work and slippery places. In a word, it was a good tripod, but a bad alpen-stock. We took it with us over the Roseg glacier in an attempt to scale the Piz Roseg in the Engadine, but found it too heavy and too blunt for glacier work. Another time, there being three travellers in the party, we essayed to use all three poles in a photographic tripod. The poles were made in England with a view to this, and a proper metal union was constructed for the yoking of the poles together. In this case, too, a tolerably satisfactory tripod was forthcoming (although the legs should have been tethered below to prevent their slipping); but in the first place, the metal union was a very heavy bit of apparatus to carry; and in the second place, it was rather irksome to the travellers to be called together, and to remain idle every time the photographer of the party wanted to take a picture. On this occasion we crossed the Scandinavians with a camera, and on the second day the heavy metal union was cast away, its place being taken by an improvised bracket of tin, made from the lid of a Huntley and Palmer's biscuit tin, the tin itself being employed in lieu of a cauldron for soup-making.

The last tripod we have experimented with is one recently described in these columns—a cane containing two metal tubes, one within the other. It would be possible to get this stand of greater height, no doubt, but ours stands when set up but three feet. It is, however, the sturdiest stand we are acquainted with, taking its compactness into consideration, for the metal tubes are comparatively heavy, and present little surface to the wind. The stand, indeed, acts as ballast to the light camera surmounting it, and makes the apparatus steadier than it would be. A mountaineer's pole thus constructed would be a little heavy, but might be trusted to bear weight.

Mr. William England, who has had more experience, probably, than anybody else in the matter of photographic journies, has for the past fourteen years used only one tripod, a high bamboo one. So that it should not be unwieldy, each leg consists of two joints, which are put together like a fishing-rod; in fact, Mr. England calls them fishing-rod joints. Fastened together, these six lengths of bamboo look like fishing tackle, and Mr. England is more often taken for an angler than a photographer. The tripod, for strength and lightness, is unrivalled, and as Mr. England makes it a rule never to photograph in a wind, the stand is always steady enough for his purpose. Mr. England, we may mention, makes it a rule to employ a very broad base-board, and he believes many shakey cameras might be cured of their defect by adopting this expedient. Many photographers employ dependent weights to their tripods, but Mr. England never does so.

Mr. England goes nearer towards solving the difficulty to which we alluded at the beginning of this article; namely, to obtain a tripod of proper height for the travelling photographer, which shall be portable and steady; but if a stand nearly as high as one's eye is not to be had, or not to be trusted, then steadiness alone should be the point to which the photographer's attention should be directed in choosing a tripod.

The "At Home" next week will be, "Messrs. Winter Brothers at Vienna—Photography on Canvas"; the following "By-the-Bye" will be "About Photo-Lithography."

ODD JOBS.

BY THE AUTHOR OF "LOOKING BACK."

No. 6.—My Friend the Captain.

THAT there is romance in photography, I think no one can deny. The wonderful little turns that it has given to me will amply carry out that fact. Since I wrote my last article, under the above heading, I have had a most singular and painful "job" to do. Long years ago, when I was residing in a small fishing town on the east coast of Scotland, I happened to be walking on the wharf, when a little boy playing too near the edge, slipped his footing and toppled over. The water had hardly settled over his head, when a young man who was in front of me, without the slightest hesitation, sprang in and held the little fellow up until a man in a scull boat came to the rescue.

That was the first I saw of Peter Nichol—the rescuer, not the rescued. We became great friends after that incident, and during my stay in the little place I had a most faithful, intelligent, and noble minded companion. Years passed, and Dame Fortune, who seems to take great delight in moving me about, landed me in Genoa. I there shipped for Plymouth on board of an Italian barque named the *Arpocrate*. When I went on board, who was the first person I saw but Peter—Peter grown stout, and black with exposure to the sun as a negro. We knew each other at once, and it is needless to say that the old friendship was instantly renewed. With the exception of Peter and myself, the whole crew were Italians, and let me say, for the sons of Rome, that I never enjoyed a voyage more than I did that one. Capitano Ballestrino was a gentleman every inch of him, and our little *reunions* in the evenings were the joyous meetings that we stumble over only once or twice in a lifetime. There was one particular evening while we were tacking against a stiff breeze—just off Folkestone—that will be remembered as long as any one of us lives, and it will be linked with everything that is jolly and the name of Peter Nichol. But I wander. When we got to Plymouth we parted company, and, sailor-like, Peter never wrote me, although I kept him posted as to my whereabouts. Ultimately I got wearied of writing without ever receiving a scrap in return, so all trace of each of other was lost.

The other morning, when I stepped into the studio, I was saluted with—"We have a very odd job for you this morning, Mr. B——. A man committed suicide last night. Mr. T——, who does the work for the coroner, is laid up with fever, so they have sent here to have the body photographed this morning.

When you don't feel particularly well, such a salutation does not liven you up very much. However, there is no kicking against the pricks. So, with as good a grace as possible, I got ready my dry plates, and drove off to the Morgue. During my long years of experience, I have had numbers of corpses to photograph (from a new-born babe, to a dried-up mummy of a century); but, singular to say I never went with so much reluctance as I did to this "job." When I got into the room where the still form was stretched—when I heard the soft trickle of the water, as it coursed over the marble table—I could not, for my life, turn my full gaze upon the body. I turned my back to it. I fixed up my tripod. I screwed on my camera, and then——My heart seems to stop its pulsations even now, at the very thought of it. There were the crisp curls, the broad, pure brow, the neck so shapely, that told at once of the strength that lay beneath—that strength now gone for ever! There was no mistaking that face. It was Peter! it was my friend the captain. What I thought, what I felt, it goes beyond my pen to tell. With my mind in a whirl I exposed my plates, and rushed from the place. When I got to the studio, I found some sitters waiting. No, sir, they were not children! Albeit, I excuse you for thinking so, going by the old proverb, "that it never rains, but it pours!" They were nice young ladies, and—shall I tell the truth? Yes, I did linger over them! I took negative after negative, until they must have imagined I had fallen in love with them; and therein, most likely, have given a few nice sitters to the next photographer they may favour. If he fancies that, having secured one good plate, they will be satisfied, then he shall know how many I took of them. No, sir, there was no love for my sitters or for my art. I only meant to prolong the developing of Peter's plates as long as I could. I only tried to tone down the shock I had received. Ungallant, perhaps, but true.

My exposures were, I believe, about four or five seconds, for although the room was but meagrely lighted, the walls were whitened and the marble slab white, so that with the above exposures I made very uniform pictures—no particularly violent contrasts showing in the shadows—the dark hair or long flowing beard to the white surroundings. I developed with pyrogallic, using a smaller quantity of this than I generally do with better lighted subjects, and in proportion an increased amount of bromide and ammonia.

Let me here say that I have developed negatives of all descriptions: I have felt the sickening depression when starting upon the fifth plate of a howling "mother's pet"; I have muttered oaths "not loud, but deep," over fools that did not know what they wanted; I have ground my teeth and vowed vengeance upon the poor old maids of Bath who wished to be taken like Mrs. Cornwallis West and Madame Langtry; I have grinned over old men with young wives—old men with the dye running off their scranny whiskers on to their dentist-filled checks—old men whose brown wigs were palpable frauds—old men of sixty or seventy with wrinkled faces, "their eyes purging amber and plumtree gum"—who wished to look as young as their dashing dames of five-and-twenty; I have groaned in spirit at the remonstrances of the widow who reproachfully abused in plaintive tones because I had reduced her prize show proportions to the respectable figure of "fair, fat, and forty," instead of the slender slimness of sweet seventeen.

I have developed equally galling and mind-upsetting negatives, but never did I set to work upon any with the feelings I did upon those of Peter Nichols: when the image appeared I felt the perspiration burst from my brow and trickle as coldly down my cheeks as I had seen the jets of the Morgue trickle down his. I felt a creeping chill go up my spine; I felt my hair bristling on end. I felt as if my poor friend's shade was peeping over my shoulder, and watching me work!

That same night I informed the police of my knowledge of his name and whereabouts: the whole truth came out. Peter, with his great honest heart, had married a woman who could not appreciate him—whose mind and passions were never meant to reciprocate his. His lavish bestowment of money and trinkets upon her had even the wrong construction put upon them. "He means it as a peace offering," she would remark. "Is not he a fool?" Her infamy was discovered when he came from a long voyage; there were bitter words, and Peter departed swearing he would have revenge. He went straight to a lawyer's office, and willed over his share in the vessel to her, and all his personal effects—that was Peter's revenge! A fool's revenge, perhaps, but great, good-hearted men prove oftenest the greatest fools in the world's eyes where strong affections are concerned.

I often wonder how poor Peter's widow felt when all—when his last great act came to light. I mean the will, not the other; yet "Judge not," &c. Such was my friend the Captain.

ALCOHOLIC SOLUTION OF TANNIC ACID FOR PREVENTING FRILLING.

BY A. J. JARMAN.

From the commencement of the use of gelatine dry plates there have been numerous complaints from different photographers of one great trouble in connection with their use, and it is certainly not one of the least of the difficulties in the use of gelatine: the trouble I refer to is frilling. The maker, of course, should know whether his plates possess this quality or not, but, unfortunately for him, he could not be certain that his plates were free from frilling until they were made, and tried when dry; when such was found to be the case, all sorts of remedies were resorted to for the cure of this evil—a solution of potash alum standing, possibly, at the head of the list. Many have found the application of methylated spirit thoroughly successful when all other means have failed to save a valuable negative. I have often found it so; but what I have to propose now has stood the thorough test of experience; even during the excessive hot weather last summer it proved itself perfectly effectual, and enabled plates to be made when otherwise the making would have to be abandoned. The formula is as follows:—

Tannic acid...	5 grains
Alcohol	1 ounce

When the tannic acid has completely dissolved, add forty minims to every twenty ounces of emulsion; vigorous stirring must accompany the addition of the tannic acid solution. It may now be thoroughly filtered, and the plates coated. Upon trial, with plates prepared with the above addition, no such thing as frilling will take place; only in one instance have I ever seen frilling take place when tannic acid was added, and this was after a prolonged heating to 140° Fah. for twenty-four hours, the tannic acid being mixed with the emulsion before this long-continued heating took place. I think such a test as this is entirely outside the domain of practical emulsion making.

Tannic acid does not appear to act at all upon silver bromide in gelatine, as I believe chrome alum does. If a strong solution of tannic acid be applied to a gelatino-bromide emulsion, it will be observed that the gelatine gradually separates from the silver bromide in flakes, and is quite transparent.

The above proportion produces no such result, but, from practical application, is just the right proportion to give suitable toughness to the film, without interfering with its adhesive properties; neither does it interfere with the sensitiveness of the film, which has been proved by coating plates with some of the same emulsion without the addition of tannic acid, and comparing the exposures; while it is well known that however small the quantity of chrome alum added, although it stops frilling, it very materially interferes with the sensitiveness of the plate.

It is always advisable to employ a small quantity of alcohol in the emulsion, besides that in which the tannic acid is mixed, because it helps very considerably to incorporate the tannic acid thoroughly with the emulsion.

I believe it would be quite possible to make gelatine plates in the tropics by adopting the above use of tannic acid solution, although, if decomposition was long set in, and much *meta-gelatine* had formed, I do not think tannic acid would cause such decomposed emulsion to produce plates free from frilling; but in the usual way of working I am quite sure that a tendency to frilling is completely arrested.

Notes.

Mr. Walter B. Woodbury lectured on Balloon Photography last week at the Aquarium. Mr. Woodbury's camera, which our readers may remember is sent into the air by a small balloon, and worked from the earth by electric wires, is to be practically tested in Paris next summer, the idea being to photograph the French metropolis in sections.

Won't do," said a friend quietly, but knowingly, as he handed us back Mr. Bolas' detective camera; we had tried to make it clear to him how it could be made to photograph while held in the hand like an opera glass. "Won't do at all; why, it shows the things all upside down."

Bromide of potassium, which during the past few years has become a favourite medicine, is now proposed by Dr. Gibson as an antidote for sea-sickness; or, rather, as it is more soluble, Dr. Gibson prefers sodium bromide, a drachm of which is taken with one's meals three times a day, some two or three days before sailing.

A trite application of photography. Dining, not long ago, at a house in which the camera is something more than a familiar plaything, the dessert plates were set round, covered with photographic d'oyleys. They were somewhat the form of small mats, the centre occupied by a photographic portrait—the size of a cabinet bust—and the margin consisting of white fringe. The portraits were printed—some on cambric, and some on silk, and were backed with red lining, which gave the fabric a roseate hue.

The d'oyleys had a still further interest. They were all portraits taken by the host of visitors he had entertained. Here was the thin face of Mark Twain in profile, his forcible features and characteristic moustache not to be mistaken; here the smiling face and flowing beard of the late Tom Hood; here Henry Irving, who bids fair to die a millionnaire; here Toole the comedian, and Lionel Brough; here Henry Lee, F.L.S., Professor Abel, C.B., the late Thomas Sopwith, F.R.S., &c., &c. The portraits cannot speak, but they lead to speaking on the part of visitors, and thus the *mauvais quart d'heure* between dinner and dessert is agreeably bridged.

There is nothing novel about these portraits: they are simply printed upon albumenized fabric. Here is the process in brief. Remove all dressing from the fabric by boiling in water containing a little potash; dry, smoothen, and albumenize with:—

Ammonium chloride... ...	2 grammes
Water...	250 cub. cents.
White of two eggs	

The eggs are beaten and allowed to subside, and the mixture strained. A strong silver bath (70 grains per ounce) is used for sensitizing, and printing, toning, and fixing must be done in the same day. Do not use a hot rolling press to finish, as it may stain.

When we were in Vienna in the autumn, a chemist asked if we could procure him a copy of "Researches on Light" by the late Robert Hunt. He was making a historical collection of the works of the fathers of photography, and to those of Niépce, Daguerre, Fox Talbot, Mungo Ponton, and Herschel, he wished to add this now rare volume. Our friend was not a little surprised when we told him that Robert Hunt was not only alive and well, but that a new edition of his Cornwall Legends had but just appeared.

But, perhaps, the best proof that the author of "Researches on Light" and "Photography" is still in good health is afforded by the fact that he has kindly promised us an article on ante-Daguerrean photography, a subject upon which no man living is so competent to write as Mr. Robert Hunt. We shall place it first in our Year-Book for 1882.

When Sarah Berdhardt visited America, 6,000 copies of her photograph were hastily packed off by one firm alone, in this country, to the same destination; now, we hear that there accompany Adelina Patti to the United States 10,000 portraits from Bergamasco's studio in St. Petersburg. Evidently there is no need to teach some photographers their business.

Mr. Edward Whymper, the first to climb the Chimborazo—as he was the first to scale the Matterhorn—promises us a paper on photography in high places for the Year-Book; and Mr. G. M. Whipple, B.Sc., the director of Kew Observatory, will describe therein a new cloud camera for meteorological observations.

An ingenious idea from our talented friend Mr. A. Eggis is placed before our readers this week. A number of low reliefs, such as carbon prints, are to be piled on each other so as to build up high composite relief. Supposing that a number of carbon prints were made on flexible support, and all transferred to the same rigid surface, precautions well known to printers being taken to ensure register, Mr. Eggis's idea might be easily and simply carried out.

Those interested in the production of "magic photographs," and of transparencies by the aid of a surface of luminous paint, may like to know that it is now included in "Judson's dyes," and may be purchased at a shilling a bottle.

Another interesting discovery made by means of photography. It used to be thought that the magnetic disturbances observed from time to time underground were due to violent changes taking place in the bowels of the earth. But it has been found that the same action is observed in the atmosphere during storms, and that magnetic disturbances are found as much above the earth as below it. Photography is employed to watch and trace such disturbances—that is to say, the movements of a swinging bar magnet—and Professor Stokes tells us that the coincidence between the photographic records or curves left by earth currents, and those left by magnetic storms, is most remarkable; every peak of the one, you may say, answers to the peak of the other.

THE SWAN COLLECTION OF PHOTOGRAPHS AT NEWCASTLE-UPON-TYNE.

The exhibition of photography which was opened to the public yesterday morning at the Central Exchange Art Gallery is one that will do credit to a town even of the standing of Newcastle. Although avowedly brought together for the purpose of demonstrating what can be produced in the way of photographic pictures upon the gelatino-bromide plates prepared by Messrs Mawson and Swan, the exhibition is well worthy of being visited, not only by photographers, but also by the general public. Unfortunately, at the time of our visit yesterday afternoon, the catalogue had not been printed, so we hope contributors will forgive any error or oversight of which we may be guilty in this imperfect description. To begin, we may mention that the Central Art Gallery is a very lofty and well-lighted building, semi-circular in form, and of this a section has been devoted to photography, the rest being occupied by paintings. Since, however, the latter are screened off, they do not mar the more sombre effects of the photographic pictures. Mr. Swan had intimated that he would give two silver medals to the most deserving contributors, but this number in the end was largely augmented; indeed, the jury awarded three silver medals and seven bronze ones. The silver medal for portraiture was awarded to Mr. B. Scott, of New South Wales, for a charming study of a female head; it is a bust portrait of a lady in evening dress, the posing and lighting being managed with much taste, while the model herself is very pleasing. Messrs. D. and W. Downey secure a bronze medal for a frame of portraits, of which one, a portrait of Miss Violet Cameron in character, is enchanting; and Messrs. E. Day and Co., of Bournemouth, are also rewarded with a bronze medal, given, we suspect, for the soft hazel eyes of Mabel, into which visitors to the London Exhibition have looked with admiration. Messrs. Chaffin and Son, of Taunton, receive a like award for "The Signal," a lady enveloped in soft woollen shawl, dropping a rose from her balcony. For landscape pictures, the silver medal is given to Mr. A. G. Pettitt, of Keswick; he has two lake scenes; it may be said, nature in joy, and nature in sadness. The latter shows the sweet placid waters of Keswick, with range upon range of dark hills beyond, and it is this that earns the distinction. A bronze medal is given to Mr. F. M. Sutcliffe for a country lane scene, with soft hedgerows and with English homesteads beyond. A bronze medal also falls to Mr. J. P. Gibson, of Hexham, for a marvellous bit of photographic printing and composition, being some quaint old houses at Hexham; it reminds one of the delightful pictures of Mr. Harvey Barton, and we can give no higher praise. An extra silver medal is justly awarded to Mr. Abel Lewis, of the Isle of Man, for a magnificent frame of instantaneous views, most of which were shown in London; and an extra bronze medal is given for interiors, those of Mr. H. Manfield being adjudged most worthy to receive it. Mr. Manfield's Marble Hall and Interiors of Lichfield and Canterbury Cathedrals are too well-known for us to dwell upon their high excellence. Finally, the one extra bronze medal is awarded to the pretty snow scenes of Mr. Hendry, of Godmanchester; the frosted trees and delicate silver filigree upon twigs and branches, let alone the brightness of the little photographs, fully deserved recognition. Among other contributions of excellence, we may mention the portraits of Messrs. Russell, of Chichester, and Mr. Fielder; the fine landscapes of Mr. Brightman; the Swiss scenes of Mr. Brookes, of Huddersfield; the portraits of Mr. Hawke, of Plymouth; the carbon portraits of Mr. Greene and Mr. Winter, both deserving of praise; the portraits by the Messrs. Macintosh, of Kelso; and those of Mr. Barry, of Hull.

Topics of the Day.

PHOTOGRAPHIC RESIDUES AND WASTES: WHAT IS WORTH SAVING, AND HOW I SAVE IT.

BY SELIMO BOTTONE.

The waste products which in my business I find worth saving are, A, *Silver wastes;* B, *Gold wastes;* and C, *Collodion wastes.*

A. The *Silver Wastes* consist of: 1st. Old spent or otherwise defective baths, whether originally intended for plates or paper, as also the first water used for washing untoned and unfixed prints; 2nd. Development residues; 3rd. Sensitized paper clippings, comprising filtering papers that have served for filtering baths or blotting off sensitized papers; 4th. Spent fixing solutions; 5th. Spoiled emulsions.

I collect all my waste or spent baths in Winchester quarts, to be operated on once every three months. My developing trays, which are of white glazed porcelain (and into which I allow no fixing solution to fall) are brushed out every evening, and the muddy liquid poured into a large filter which stands over my washing sink. In this filter gradually accumulates all the silver precipitated by the developers. I fix in a dipping bath, and as soon as I find the hyposulphite begins to work slowly, in consequence of being charged with silver, I pour it into a large earthenware pan, to be treated along with the silver baths. Spoiled emulsions are boiled with a few drops of strong sulphuric acid, to render the gelatine incapable of setting, and thrown into the same hyposulphite pan. My printer puts all his clippings into a drawer, wherein are also stored old silver filter papers, and blotters from the corners of frames, &c. These clippings, &c., are burned once every month in a large flower pot, until the whole mass fairly glows, and the ashes collected for treatment along with the other wastes, as hereafter described. When a sufficient amount of wastes has accumulated to make it worth while to operate (with me this is about once every three months), I place my pan containing the spent hyposulphite out of doors. I then pour into it all the waste baths I may have saved, and give the whole a stir up with a glass rod. I now make a saturated solution of potassium sulphide in water, and add this little by little to the mixture, as long as a dark brown precipitate is produced. When a further addition produces no further precipitate, I cease. This operation must be performed out of doors, for the fumes of hydrosulphuric acid which are given off would otherwise affect the silver solutions in the operating room. The black precipitate is silver sulphide. It is allowed to settle to the bottom of the pan, the clear solution decanted carefully off, and the silver sulphide placed on a filter, and washed by allowing pure water to run through the filter, until it comes through quite tasteless. The sulphide of silver is now allowed to dry on the filter. The development wastes that have collected on the filter over the sink, as previously described, are now also washed in the same manner, until the water runs through tasteless. These, which consist of nearly pure silver, are also allowed to dry. When quite dry, these, along with the contents of the other filter, and the ashes of the paper clippings, &c., are weighed. Twice their weight of saltpetre is added to them, and the mixture rubbed up fine, in a glass or porcelain mortar. A common clay crucible, capable of containing twice the bulk of the mixture, is now placed in a clear fire, and when its bottom is red hot, the mixture is put into it a teaspoonful at a time. The mixture deflagrates, the sulphur and other impurities are oxidised at the expense of the oxygen of the saltpetre, and combine with its potash, while the silver is set free. When the whole of the mixture has been thus treated, the crucible is withdrawn from the fire, and allowed to cool. When cold, the contents are removed, and boiled in an evaporating dish in two or three changes of water, then once in dilute hydrochloric acid, to remove any earthy matter derived from the paper clippings; and lastly, washed on a filter with pure water to remove the hydrochloric acid. What remains on the filter is pure silver, which, when dry, may be dissolved in nitric acid, and crystallized in the usual manner, the result being remarkably free from zinc, organic matter, or other contaminations, usually found in silver reduced from its chloride by zinc, &c. Any black residue left after treatment with nitric acid consists of gold derived from the toned prints, and may be treated as described at B.

B. *Gold Wastes.*—In practice, I do not find it worth while to save the waste toned prints, either for the gold or the silver they contain. Of the former they contain an appreciable quantity; of the latter hardly any, certainly not enough to pay for extraction. I produce very few waste toned proofs, for if a print does not appear satisfactory when it leaves the printing frame, it is at once rejected. My wastes consist principally, as far as gold is concerned, in the dark purplish deposit which accumulates round the toning bath stock bottle, in the spent toning baths themselves, and lastly, in the black deposit which sometimes forms in the toning dishes with certain samples of paper.

The black powder which accumulates at the bottom of the toning baths, as also the iridescent purplish film which adheres to the stock bottle, consists almost entirely of pure gold. The toning bath, after each day's work, is run through an asbestos filter, and the clear filtrate brought up to strength by the addition of chloride of gold, if it works too slowly. On the filter remain any particles of gold that may have been precipitated during the course of toning. Once a month, the stock bottle (while empty) is washed out with aqua-regia (nitro-hydrochloric acid), which dissolves out the adhering gold, the washings poured into the asbestos filter, and collected in a bottle as they run through. The gold left on the filter is thus dissolved out.* These washings, which contain gold chloride along with free aqua-regia, are used again and again for the same purpose, until at last they become so saturated with gold as to refuse to dissolve off the film from the stock bottle, &c. The liquid is then evaporated cautiously to dryness in a porcelain dish over a water bath. The result is gold chloride, containing free acid. In making up a toning bath with this, carbonate of soda should be added, until the liquid is slightly alkaline to that paper.

If a gold toning bath works mealy, or in any way is defective, I precipitate the gold by the addition of a strong solution of iron sulphate; collect the precipitate, wash it on a filter, and dissolve in the aqua-regia used for washing the bottle, trays, &c., as above.

C. *Collodion Wastes.*—At one time I used to save all my old, stale, or thickened collodions for re-distillation, so as to obtain the ether for making fresh collodion; but since collodion is now to be obtained of a constant and trustworthy quality of the dealers, I have found it more advantageous to save the collodion wastes for the purpose of cleaning the glass plates. For this purpose it is simply set aside in Winchester quarts. If, after the glasses have been washed in strong solution of washing soda, they are rinsed, wiped, rubbed over with a soft bung dipped in stale collodion, and, while still tacky, rapidly rubbed with a soft diaper until all the collodion is polished off, it will be found that they will give perfectly clean pictures. Nothing is so effectual in removing old films, whether varnished or not, as stale collodion, and it has the great advantage of leaving the glasses, after rubbing with a diaper, ready for immediate use.

In conclusion, as to why I save and reduce my residues myself, instead of sending them to the refiners, I will only say, that the trouble involved in preserving the silver in the form either of chloride, sulphide, or paper ash would be the same in the latter case; while for the little extra labour required for the reduction of the silver, and its conversion into pure nitrate, one is amply compensated by the increased yield of the residues. I can honestly recommend the precipitation of all the liquid silver waste by potassium sulphide, as being the method which gives the purest and most abundant result.

BY HADAH.

In my remarks upon the above subject, I shall confine myself to what is applicable to a business of from small to moderate dimensions, as a very large business would have special appliances, &c., out of place in one of a smaller size.

In the first place, residues may be conveniently divided into three divisions:—1st. Silver from negatives; 2nd. Silver from prints; 3rd. Gold.

1*st Division.*—In a business of moderate dimensions it is my opinion that it is not worth the trouble to save the small amount of silver remaining in the spent iron developer, as the bulk of the silver is, or ought to be, used in forming the image on the plate; consequently I should connect the waste-pipe with the drainage, so that all the washings flow away at once. Not so, however, with the pyrogallic and silver, or iron and silver for intensifying, nor with the saturated fixing solution, whether cyanide or hyposulphite, as these are well worth the small amount of trouble required to save them, and yield a rich return.

My plan of proceeding is as follows:—At the back of the sink, as being most convenient, have two small funnels fixed, communicating with two large jars or vessels underneath, and into No. 1 of these pour the waste intensifier, whether pyrogallic and silver, or iron and silver; and into No. 2, the waste fixer, either cyanide or hyposulphite. This in practice is no more trouble than pouring it down the sink, and the funnels, being small, need not be in the way. When No. 1 jar is full, allow it to stand all night, and in the morning pour off the liquid carefully, taking care not to disturb the sediment at the bottom, which will consist of metallic silver. Leave this at the bottom and go on again, until you are ready to send off the waste to the refiner, when it can be collected on a filter, dried, and mixed with the other residues. To No. 2 jar, when full, if cyanide is used for fixing, add a few ounces of commercial hydrochloric acid, taking care to do so in the open air, and not to inhale the fumes, which consist of prussic acid gas. Add more acid till no further fumes are evolved, and no further precipitate is formed. Allow it to subside, collect the sediment (silver chloride), and add to the other residues. If hyposulphite is used for fixing, it must be treated with the waste hyposulphite from the prints. Of course if a bath is used for the hyposulphite, or indeed for the cyanide, the second funnel can be dispensed with, and the bath itself emptied direct. All blotting and filter papers containing silver must be thrown with the print cuttings.

If dry plates are exclusively used, of course only the hyposulphite will be saved, as none of the other solutions contain silver.

We now come to No. 2 Division—silver from prints. It is most economical to trim the prints before toning, and even in case of prints to be enamelled, or mounted for colouring, I always trim some of the surplus paper off, which saves gold and silver, as toned and fixed prints are not worth saving for the gold and silver they contain. The cuttings then are duly collected, with all refuse containing silver, and stowed away in a bag or box till sufficient have accumulated to form a consignment to the refiner, when they should be burnt either in the open air on a still day, or in an open fire-grate carefully swept free from dust and ashes. Feed the fire with small pieces at at a time, pulled loosely apart, and you will then have it all burnt, and no lumps in it. All old films from negatives, when dried, should be burnt at the same time, as these are rich in silver. A convenient way to collect these is to pour the soda or potash solution used to remove the films through a piece of muslin, which must be then well squeezed, and the contents pulled in pieces, and put with the print cuttings to dry of themselves. The waters that the prints are washed in should be thrown into a large tub, having a tap a few inches from the bottom, and a handful or two of salt, and a little sulphuric or hydrochloric acid added every Saturday, and the clear fluid drawn off every Monday morning, leaving the residue (silver chloride) at the bottom. This can be collected when required.

---

* Should any difficulty occur in getting asbestos, an excellent substitute will be found in *crushed glass*, the coarse particles being placed at the bottom of the filter, and the finer portions over them.

Next we have the hyposulphite—whether from negatives or prints—and in my opinion the worst by far to deal with. It should be poured into a tub, and, when required, a solution of common potassium sulphide, known in commerce as liver of sulphur, added, till no further precipitate is thrown down; and after standing a time, the fluid can be drawn off, and the deposit (silver sulphide and sulphur) dried, and placed in an iron shovel over a fire with a good draught, and all the sulphur possible burned out of it, and, when cool, this is ready for the refiner. If in small quantities, the above residues may be mixed all together; but in case of large quantities it may be as well to keep the hyposulphite residues separate. And here let me say that I have several times made a rough assay with a small portion of the well-mixed residues by reduction on charcoal with a blow-pipe, and in every case I have been convinced that I have received full value for my residues, though it was astonishing how near I could calculate what I ought to have for them.

The No. 3 Division of my subject—waste gold—requires a few remarks. If the acetate bath, or any bath that is used repeatedly, is in use at the establishment, I am strongly of opinion that, if carefully used, the waste is practically *nil*, or at least is so small as not to be worth saving; but where carbonate or any bath is used, and used but once, if a fair quantity of work is done, it may be worth while to pour it into a large jar, and, when full, allow to stand a few days, when the liquid may be poured off, leaving the gold as a black powder at the bottom. It will not require anything adding to it if alkaline, but if not, add a little carbonate of soda. The clear portion can be tested for gold, with a little sulphate of iron solution, and if no deposit ensues, may be thrown away. The residue must not be mixed with the silver residues, but sent by itself.

In conclusion, I may say that the above subject—the saving of wastes—is well worth the attention of even the humblest photographer, and, if systematically carried out, will result in a considerable reduction in the year's expenditure for materials.

The "Topic" next week will be "Dark Room Notes," by Focus Junior.

BALLOON PHOTOGRAPHY.

BY WALTER B. WOODBURY.*

I have been asked to deliver a paper on the subject of balloon photography before you this evening; but the subject is one upon which, I am afraid, there is not very much to be said. So little has been done as yet, that, though I believe the day is not far distant when we may be able to obtain bird's-eye views of all the principal towns and villages of the world photographed and laid map-like before us for our minute inspection, still, up to the present day, nothing really of a practical nature has been accomplished in this particular branch of science. The difficulties in the way, however, though very numerous, have been considerably decreased by the introduction of photographic dry plates, from twenty to fifty times more rapid than the means we have hitherto had at command.

We have first to consider the fact that it is not the object we wish to photograph that is in rapid movement, but the instrument with which we are working. Let us suppose a train going at express; if the camera were perfectly steady, the rapidity of the exposure would represent the train as almost standing still; but if, during the same rapid exposure, the camera moved (say) only the hundredth part of an inch in any direction, the effect on the exposed plate would be that of the train as well as the whole landscape having moved some dozens of yards, which would be fatal to all ideas of getting anything like a sharp or clear picture. It becomes very evident, then, that, for this purpose, we require, not only the most rapid plates that can be made, but also the quickest form of (quasi so-called) instantaneous shutter. I add quasi so-called, because the word instantaneous can only be classed with such unfathomable words as "space" and "eternity." Given what is called "instantaneous exposure," the same may be divided again into hundredths, thousandths, *ad infinitum*. We can only try and get as near instantaneity as possible, and then still be a long, long way from it. Therefore—as I have before said—the most rapid plates and shutters are of first necessity.

Luckily, we have a great advantage in the fact that distant objects, to be rendered sharp and clear, require the minimum of exposure. All photographers well know that when a landscape, artistically chosen with its foreground (say, of trees, rocks, and water) is very much under-exposed, the whole will be a black mass without the slightest detail, with the exception of the distant hills, which will be found to possess every ravine or watercourse distinctly marked; on the other hand, to produce an artistic picture, using, perhaps, twenty times the exposure, the trees and rocks forming the foreground will be full of the most minute details, and the distant hills have that softness and aerial perspective which will make a picture of the photograph; but when we come to examine the distance in the two photographs, we shall find that the detail in the distant parts of the well-exposed one are no longer sharply defined, but have become a blended mass. Now, what is a fault in the artistic landscape is the opposite in our balloon photograph, as the whole of our picture is composed of distant objects, and therefore we want only such an exposure as will give us the hard outlines with a slight amount of half tint. We must not expect to get artistic pictures so much as plans. From what I have explained, it will therefore be seen that for the purpose of balloon photography, considerably less amount of exposure is necessary than for views taken on *terra firma*.

The next question to be considered is the relative advantages of photographing from a free or captive balloon. These are decidedly in favour of the latter; as in the case of the free balloon the exact tract of country it is wished to photograph could not be decided on beforehand, it would be that only over which the balloon might happen to be wafted, no return being possible. On the other hand, the anchorage (if I may so call it) of the captive balloon could be so shifted as to bring the balloon exactly over the spot required to be photographed.

We have next to consider the various movements of the captive balloon and its attached camera. We have the question here of the rotary motion, as the cord holding it (supposing there to be even the faintest movement of the air) necessarily tends to keep the captive balloon in one direction. A light rudder or sail, as I suggested some years ago, might perhaps with advantage be attached to the opposite side of the hoop, to help in keeping it steadier. The principal difficulty then remaining to be overcome is the swinging or pendulum-like motion of the balloon in its captive condition. This would be endless were the camera suspended by a single cord from the hoop of the balloon; but by attaching two wires or cords to the cameras, at right angles to the line taken by the cable holding the balloon, we do away with the swinging from side to side, and have one then to contend with—the motion or swing from back in the direction of the wind. But this seems the most difficult one to overcome, as, if the camera were fixed to the hoop, there would be no chance of getting an absolutely vertical picture, such as would be necessary to get a correct map of the earth beneath. I believe, however, this obstacle may be, if not entirely obviated, at least considerably modified, by the use of elastic india-rubber cords, instead of ropes. By this arrangement the swing of the camera would, at any rate, be very greatly diminished. I am indebted for this idea to an observation made by a fellow-passenger during a rough nocturnal Channel passage. The lamp suspended in the centre of the cabin attracted my attention while lying in my berth, as, notwithstanding the rolling and pitching of the vessel, and occasional shocks from the waves, it behaved in a very steady manner. I got up, therefore, to examine the lamp, and I found that it was attached by four india-rubber cords at its four corners to the ceiling. As everybody was asleep, I unfastened the cords, and instantly the lamp began to swing to and fro quite furiously. Having re-fastened the cords, I returned to my berth with a knowledge acquired that I thought might be useful hereafter in connection with the subject now under consideration.

The camera that I have constructed with the special object of taking views from a captive balloon is now at the Paris Exhibition, so I shall have to content myself with explaining its mechanism. This camera, with the necessary apparatus and four prepared plates, weighs about twelve pounds. It is made specially about four inches longer, so as to allow an extra space to protect the lens in case of a too rapid descent. Just above the lens, and attached to a slide that can be drawn out, is a revolving disc worked by an india-rubber spring, which will give four or more revolutions—one each time the catch is released by means of a small electro-magnet. In the upper part is an inner sliding body for focussing, carrying a drum on which are placed four prepared plates; this drum has also a spring, causing it to revolve each time one-quarter of its circumference by acting on another small electro-magnet; this brings another plate into position. The instantaneous shutter is then again acted on in its turn, and so on, till the whole of the four plates have been exposed. Owing to the india-rubber or other spring gradually losing its force, the first exposure will be more rapid, and the second less so, the fourth the slowest. This deficiency will allow of an equality of exposure being obtained at different heights, the lowest exposure being given the last, when the spring is at its weakest. Of course the number of plates, depending only on the size of the camera, need not be limited; between the lens and plates is a square diaphragm to cut off any extra light from impinging beyond the edge of the plate.

---

*Read at a meeting of the Balloon Society of Great Britain.

As will be seen by the early drawing accompanying my specification of 1877, my idea was then to use a continuous roll of sensitive tissue in motion, and stopped by clockwork, contained in the camera; but as I found that enlargements made from such prepared tissues did not give anything like the delicacy of the ordinary photographic glass plate negative, I abandoned that idea, and substituted the revolving drum just described. We must be able to get a good enlargement from our small negative, otherwise it would possess little value.

(*To be continued.*)

Correspondence.

PHOTO-ENGRAVING.

Dear Sir,—I have seen at the Paris Electrical Exhibition very fine specimens of galvano-photographs—*i.e.*, medals, pictures, &c., obtained photographically on metal with a splendid high relief. They attracted much attention, and really deserved it. Of course the process by which these are produced remains the secret of the exhibitor; all that can be known about it is through the moulds and specimens hanging on the wall. The series is composed of an ordinary photograph on paper, a plaster (?) mould, and the finished metallic picture.

I was very much interested in this exhibit, of which no photographic journal has yet spoken. Perhaps it may be interesting to give you an account of my own experiments, made three or four years ago, in the production of photo-reliefs. Enclosed you will find the first and sole result I obtained, for I have had no opportunity to continue my essays. Its production gave me very little trouble. I took a carbon print on glass (therefore in relief), metallized it with graphite, and put it in an electro-copper bath; the current had to be strong, as the gelatine soon began to swell up. As you will see, the relief obtained is hardly visible, but the portrait is recognizable.

This embryo caused me to draw the following conclusions:—1. The relief must be more accentuated. 2. Several of the dark parts (as the hair, the mustachios), instead of standing out, are hollow. 3. A gelatine print is not suitable for the bath.

To supersede these defects, I thought of proceeding as follows:—

1. A relief of any depth and height may be obtained in making two, three, or more gelatine proofs (of the same negative), and superposing these, while wet, exactly upon one another. When the print is thin, two or more layers will not increase the lights to a sensible degree, while when the relief is more accentuated, two or three thicknesses will augment the relief in a notable manner. 2. Those of the dark parts of the photographs which develop hollow instead of standing out, could be painted upon or erased on the original in the same way as a negative is retouched. This work would not be difficult. 3. Of the gelatine mould obtained in such a manner, nothing would be easier than to take a plaster cast, which would be a positive. To avoid the taking of a second cast, it would be necessary to begin the whole process with a positive on glass instead of a negative.

The plaster cast, after soaking in melted paraffin, is very easily metallized, and can be put in the electro bath any length of time. To finish the copper impression or relievo, it could be silvered or gilded at will.

I make these remarks for what they are worth, having not had leisure enough to go further with my experiments. Should any of your readers find time and opportunity to take them up, I should feel pleased to hear of his success in the News.—Yours, &c., Ad. Eggis.

[Our esteemed correspondent sends us an impression in copper from a photograph, which makes us very sanguine that the process he describes is likely to prove a practical one. The reliefs he refers to were described by our special correspondent in his article on the Electrical Exhibition..—Ed. P.N.].

COLLODIO-CHLORIDE EMULSIONS.

Sir,—In your issue of Oct. 21st was an article by Capt. Abney, on "Collodio-Chloride Emulsion." Being desirous of carrying out the formulæ there given, I set to work and have prepared several batches, but without the slightest success, even after the utmost care possible.

It often happens that there is some slight omission in such descriptions, some little dodge or precaution unmentioned, which, unless discovered, renders the formula of but little value practically.

I can generally succeed with such things, having tried so many. I have four batches now before me; two treated with cupric chloride, and two with auric chloride.

The former being, as usual, a very acid salt, I tried one drop of ammonia, thinking it was the acid produced the fog. One batch I treated with four drops of fifteen-grain solution of gold previously neutralized with precipitated chalk, the commercial gold being very acid.

The fog will not go. The only modification of directions that I made was to put the silver solution into the boiling alcohol, instead of *vice-versa.* I noticed a slight milkiness as of carbonate or chloride there, but the alcohol being marked sp. gr. ·803, involved the presence of sufficient water to effect that change. Still, as directed, it being mixed in ordinary light so far, actinic action might be possible in sufficient force to be affected by development.

Can you give me a suggestion? I obtained fresh samples of all chemicals used for emulsion and for developer. The colour in daylight of the washed emulsion on a plate is certainly not "canary," but milk white, or rather sky-blue. Why is this? The pyroxyline is easily soluble; the silver is that I use every day for wet work and for printing. What is the purpose for boiling the alcohol, and should it be boiled for several minutes?

I tried absolute alcohol reduced with distilled water. I do not care to have to throw every batch away, so shall keep them until I have the favour of your suggestions, or that of any one else who can enlighten my ignorance.—Yours truly, R. O.

[We dare say Captain Abney will be able to help our correspondent.—Ed. P. N.]

TOPICS OF THE DAY.

Sir,—Might I venture to suggest that you give us a Topic on Negative Retouching by Artificial Light. Many of us, now that daylight is so valuable, would be thankful for an article by a practical man on that subject.—Yours, &c., F. M. S.

[We shall endeavour to meet our correspondent's view, and trust others will follow his example in suggesting practical "Topics."—Ed. P.N.]

INTENSIFICATION OF GELATINE NEGATIVES.

Dear Sir,—Several of our negatives intensified by Edwards' formula some twelve months ago are completely spoiled as regards their printing qualitiesg—one quite yellow, and the retouching black in streaks on face. Can you kindly inform me of any way to restore them to their proper printing density and colour? I have tried re-intensifying, but to no purpose; they will not come so that I can print them. If you can help me, I shall be extremely thankful. —Faithfully yours, Intensifier.

[Dr. Eder will have something to say on this subject shortly.—Ed. P. N.]

Proceedings of Societies.

Photographic Society of Ireland.

The annual general meeting was held on the 11th November, in the Royal College of Science, Stephen's Green East, Mr. **Thomas A. Bewley** in the chair. The minutes of the previous meeting having been read and confirmed, the following gentlemen were elected members:—Messrs. Herbert F. Penrose, J. Blayney, T. Roper, Junr., Herbert Bewley, Frederick H. Thompson, Charles Watson, and Fitzadam Millar.

The statement of accounts, which was unanimously adopted, showed a balance in hand of £33 11s. 2d.

The six retiring officers of Council, together with the officers, were re-elected for the ensuing year.

The following new rule was passed unanimously:—"That members whose subscriptions are in arrear for twelve months shall, at the discretion of the council, cease to form part of the Society." It was also decided that members elected in the month of October be exempted, as well as those elected in November and December, from payment of any subscription until the following year.

The best thanks of the Society were voted to the Photographic Society of Great Britain, as also to the proprietors of the *American Photographic Times*, for copies of their journals: the Photographic Society also sending its presentation prints.

Mr. John Russel, Greenfield, was proposed for membership.

It was announced that members could select their presentation prints at Messrs. Millard and Robinson's, Lower Sackville Street.

Thursday Evenings for Photographers.

At the meeting on 10th inst., Mr. C. G. **Cutchey** in the chair,

Mr. **Reiman** exhibited a portrait negative taken in the open air, with a single combination lens supplied with a scenograph apparatus, with an exposure of two-and-a-half seconds; the negative of full size figure being full of detail.

Mr. W. K. **Burton** thought that the reason why better work was not obtained with single lenses was, that too much was expected of them; he had taken some excellent portraits in an ordinary sitting room with a single lens, giving an exposure of eight to ten seconds.

Mr. A. **Haddon** said he had measured the piece of silver twill shown by Mr. Henderson as suitable for filtering purposes and found that the diameter of the wire was $\frac{1}{363}$ of an inch; 164 meshes in one direction, and 144 in the other; distance between meshes, $\frac{1}{297}$ inch. It was not pure silver.

Mr. **Henderson** showed a rough model of a simple and efficient drop shutter, constructed by Mr. C. G. Collins; it consisted of a half-cylinder, which was fixed in the camera, and, upon being released by a spring, fell by its own gravity.

Mr. J. A. **Harrison** showed an instantaneous shutter, consisting of a semi-circular disc, having a circular opening, which, when the disc was released, passed across the aperture of the lens.

Mr. **Haddon** showed an improved form of plate-rack, consisting of two metal T-pieces connected by three wire rods, which were cased with pieces of wood having notches cut in them to hold the plates; the casing of the third rod he had made to revolve. The T-pieces were drilled with a number of holes, which allowed the rods to be put closer together, and thus the rack was made universal.

Mr. **Henderson** then proceeded to demonstrate two new methods of emulsifying without gelatine, prefacing his demonstration by stating that, "if bromide of silver were formed in the presence of acids or alkalies, great softness or sponginess is obtained, thus giving great rapidity," and that the same effect may be obtained, without the use of acids or alkalies, by long emulsification. The first method demonstrated was that of trituration. The silver and bromide were first thoroughly incorporated in a mortar in their usual equivalents, and it was explained that very good results had been obtained by working up to this point in daylight, but that the operation was better performed in the usual non-actinic light; if a further fineness of separation or division were required, nitrate of potash or some inert soluble substance was added, and any amount of fineness of division could be obtained. When the silver and bromide were sufficiently pulverised together, a small quantity of either water, glycerine, ammonia, or nitric acid was added, and the chemical formation of bromide of silver took place. The nitrates might then be washed out, and the gelatine added, and the emulsion was ready for use; but preference was given to the addition of gelatine previous to washing. The second method (Mr. Henderson said) might almost be considered a modification of Captain Abney's plan. If to a solution of nitrate of silver an aqueous solution of free bromine were slowly added till the silver is all converted, the precipitate would be found to be in a spongy sensitive state, and a very sensitive emulsion could be produced by adding to a very acid solution of nitrate of silver a solution of bromide in an alkaline state, whereby effervescence was set up; or the order of this may be reversed by using an ammonia nitrate solution, and carbonate of ammonium, the bromide being added in an acid state.

Newcastle-on-Tyne and Northern Counties Photographic Association.

The ordinary monthly meeting was held on Tuesday, November 8, in the College of Physical Science, Mr. **Downey** in the chair.

Mr. G. Stewart was nominated as a member, and Messrs. Bacon, Wormald, Robson, and Williamson were elected.

The **Secretary** read an amusing letter from His Excellency Count Alexander de Lubawsky, asking to be elected a member of the Association. His Excellency enclosed his portrait, and a list describing in detail the various societies to which he belonged.

Mr. P. M. Laws presented two large photographic views to the Association.

Dr. Berwick also presented a small photographic view, the negative having been taken on a gelatino-bromide plate, and an interval of one year and eighty-one days having elapsed between exposure and development. The ordinary pyrogallic developer was used, and no forcing was required.

Professor **Freire Marreco** read a most interesting and valuable paper on the "Washing of Prints." In his opening remarks he said that it seemed to be a generally-received opinion that copious washing of photographic silver prints, after fixing in hyposulphite, was absolutely necessary, and he quoted from several photographic text-books in proof of this. He pointed out that, although the authorities he quoted from insisted upon the great necessity for copious washing after fixing, yet not one of them offered any data in proof of it. He detailed some experiments made by Mr. Dunn and himself, which showed that, with care, the hyposulphite was easily and perfectly eliminated.

A long and animated discussion was followed by a hearty vote of thanks to Professor Marreco, as also to the Chairman.

Bristol and West of England Amateur Association.

The ordinary monthly meeting was held at the Association Studio on the 2nd inst., Mr. J. **Davey** in the chair.

The minutes having been passed, and several presentations in the shape of photographic literature having been made and acknowledged,

The Hon **Secretary** presented the final balance-sheet of the International Photographic Exhibition.

Mr. H. A. H. **Daniel** remarked that the Exhibition, which had been most extensively welcomed and supported by the photographic community at large, had been, by a general consensus of opinion, admitted to be probably the finest ever held, and many intimations of additional exhibits from abroad had been received. He, therefore, proposed "that the Association's International Exhibitions be held triennially, the next taking place in 1883," which was carried.

It was also resolved, on the motion of the Hon. Secretary, that the annual meeting be held in future in February, the financial year closing on the 31st December.

Mr. E. **Brightman**, in response to a call from the Chairman, then presented some "Notes on the Use of Luminous Paint in Photography," in the course of which he observed:—"I have come to the conclusion that it is of little practical utility in connection with photography. I look upon it more in the light of an interesting scientific toy. The composition of the paint is, I believe, kept a secret, but there can be but little doubt that it is a compound of sulphur with lime or one of the alkaline earths; this compound in the case of the oil paint is apparently mixed with a resinous varnish to enable it to stand exposure to the weather, and to bind the dry powder into a paint-like consistency; in the case of the water paint, the resinous varnish is replaced with a gelatinous substance, serving to bind the mixture together in the same manner. The luminous properties of sulphide of calcium, magnesium, and strontium, have been long known, and these substances known as Canton phosphorus—a most inappropriate name, as phosphorus forms no part whatever in their composition, and the luminosity of phosphorus arising from an entirely different cause. In the case of phosphorus, the luminosity is caused by combination with the oxygen of the atmosphere, being, in fact, slow combustion. In the case of sulphide of calcium, the luminosity is caused by the molecule being thrown into a state of intense vibration by the action of light, the vibrations gradually diminishing after the light is withdrawn."

A discussion ensued, and a vote of thanks to the Chairman then terminated the proceedings.

Talk in the Studio.

Photographic Society of Great Britain.—The next Technical Meeting of this Society will be held on Tuesday next, November 22nd, at the Gallery, 5, Pall Mall East. The chair will be taken at 7.30 o'clock.

Balloon Society of Great Britain.—At the meeting of this Society, held on Friday last, Mr. Henderson expressed his opinion that the weight of the Woodbury apparatus (ten or twelve pounds) would be found an objection, and said that he was himself constructing a camera of *papier maché*, which would weigh under half a pound, but which would only take one plate, while the Woodbury apparatus takes four.

Proposed Amateur Photographic Society for S. Wales.—Mr. Morgan writes that he is not prepared to take the initiative in forming the Society, but expresses his willingness to take part in the deliberations of friends in Cardiff who may be disposed to call a meeting with the object of considering ways and means at Holyhead.

It is rather late, perhaps, to allude to the Photographic Society's Exhibition, now open at No. 7½, Pall Mall East; but those of our readers who have become really wearied with the continued succession of oil paintings and water colours hung in such profusion at the hundred-and-one picture exhibitions of the day, will, we think, find a relief in looking at the neutral tints and unagressive exhibits of the Photographic Society's Show. Though contained in one moderate-sized room, there is much variety in the photographs shown, and well-nigh every kind of taste is studied. The most striking feature of the Exhibition generally is the fact that the "gelatine plate" process, as it is called, has come all but invariably into use; a more special feature being the excellence with which instantaneous views are now taken. Some photographs illustrative of the soldiers' sports at Aldershot are admirable examples of this, some of them showing gymnasts in mid-air in the act of dropping from a trapeze, whilst others fix them in the middle of a somersault. Photography has done nothing more charming, however, than the Welsh views of Mr. H. P. Robinson. These studies of Nature, into which figures are introduced with true artistic feeling, are decidedly the gems of the Exhibition, and we were not surprised to see that they earn a medal for their producer. *Apropos* of the instantaneous photography we were speaking of, there is, it seems, a pocket apparatus now in use, resembling an opera-glass in outward appearance, and so arrangad that anyone whilst holding it to his eyes can focus a distant face, andsecure a photographic reproduction of it in the shortest conceivable space of time. Thus the "chiel amang us takin' notes" of Burns has become a chiel who takes our photographs—and faith, too, he'll "prent 'em"! A comic contemporary has already shown to what a reign of terror in theatres the use of the above pocket photographic apparatus will lead. The sight of a glass levelled at one will fill one's breast with—well, it all depends who the "one" is. There are some people—professional beauties, for example—who surely will not object to being photographed, say, from a score of points at once. It may become a fair belle's boast, indeed, that she has been the focus of the pocket cameras of a score of enthusiastic "dress-circlists" simultaneously; whilst another may find, to her reasonable chagrin, that a malicious rival has obtained a reflex of her features at a time that a yawn, or possibly a sneeze, was disturbing the serenity of her facial muscles. As to actors and actresses, they will be liable to be taken, not in particular scenes or acts, as now, but in well-nigh every sentence or line in which a change of expression is to be noted. Nay, we may even see in our printshop windows, "Mr. J. L. Toole's last laugh: a series of six cartes," or, "Mr. Irving's frown, in seven views and an introduction"! Photography, in fact, like the electric light, is likely to achieve greater wonders than it has yet accomplished.—*Figaro.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

*** The Year-Book.—We are already in receipt of several important articles for the Year-Book. Might we ask all those who still contemplate favouring us with contributions, to be so good as to forward them *immediately*.

Ignorance.—The exact strength depends on the circumstances of of each special case. A solution containing five grains of the former and eight of the latter to each ounce of water has given good results.

D. M.—They very likely arise from the use of damp paper, as you suggest. First secure as good a transparency as possible, and then soak the negatives in a weak solution of potassium cyanide.

Yorkshireman.—We have used an extremely hard water for washing emulsion without observing any mischievous consequence to follow.

M. I. C. E.—1. It is difficult to judge without seeing a negative, but we are inclined to think that the defect arises from imperfect removal of the hyposulphite of soda. 2. Provided that air is perfectly excluded, and the solutions are not used, they will keep good for an unlimited time. When, however, the liquids are in use, deterioration is rapid; and it is a false economy to try and get an undue amount of work out of them.

P. T.—Clear sheet or crown glass, taking care to avoid any which has a tint of yellow or yellowish green. Look through the glass edgeway, to observe tint. Ground glass is bad—even for those parts which require shading—as it holds dirt. Cover the parts in question with thin tissue paper.

A. B.—1. It is coated with a solution of alkaline shellac, and well rolled, after which a sponging over with weak gelatine solution is required to make it take the impression satisfactorily. We have obtained it ready prepared from Dr. F. Liesegang, of Dusseldorf-on-the-Rhine. Write to him for particulars. It is also sold in Paris. 2. We will make enquiries.

Enquirer.—If the apparatus is of good quality, it will produce better portraits than could be taken with a small apparatus; but you would require a long studio. On a thick or hazy day, however, the long focus lens is at a disadvantage.

Bath.—It contains a large proportion of sulphur—often as much as 50 per cent.; but under ordinary circumstances this does no mischief, as it is intimately united with the caoutchouc. When, however, the surface becomes disintegrated and roughened, the case is altered.

J. L. M.—The red fumes will not escape until a considerable proportion of the nitric acid has undergone reduction.

M. Goddard.—1. Glass is undoubtedly the best material, as ordinary earthenware is extremely likely to absorb the chemicals employed.

E. B.—It is usually obtained by simply subjecting the gum to a sufficient heat to cause partial decomposition; but, circumstanced as you are, it would be better not to complicate matters by attempting the operation.

L. Chisholme.—1. One hour would doubtless be sufficient. 2. See the last number of the Photographic News. 3. At least three ounces and a-half. 4. A matter for our advertising columns. 5. Mr. Woodbury published something on the subject about five years ago. 6. It is insoluble in absolute alcohol, although freely soluble in water or diluted spirit. 7. Almost unknown in this country, although occasionally used in Germany. 8. Equal parts.

Fair Play.—Such an arrangement would certainly be admirable from your point of view, and there can be little doubt that by carrying it out you might realize a handsome profit. It is, on the other hand, extremely probable that the owner of the copyright may be fully alive to the fact that an accidental circumstance has made his property valuable.

Nitrogen.—The sulphuric acid plays a double part, serving to remove water from the nitric acid—thus increasing its effective strength—and also to harden or parchmentize the fibres.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1212.—*November* 25, 1881.

CONTENTS.

PAGE
The Manchester Society's Exhibition and Soiree 553
The Thorough Washing of Gelatino-Bromide Plates.............. 554
On Making and Regarding Rules 555
At Home.—Messrs. Winter Brothers in Vienna: Enlargements upon Canvas 555
Ammonium Bromide: Is the Equivalent 98 the Right One? By James Young 557

PAGE
French Correspondence. By Leon Vidal.............................. 557
Notes.. 559
Balloon Photography. By Walter B. Woodbury 560
Correspondence 560
Proceedings of Societies 561
Talk in the Studio.. 563
To Correspondents 564

THE MANCHESTER SOCIETY'S EXHIBITION AND SOIREE.

Manchester has a reputation for doing things well, and the photographic exhibition, which was opened by a pleasant *soirée* on Tuesday evening, is well done. The reputation is due, no doubt, more than anything else, to the fact that Cottonopolis is always ready to pay its way, and the assurance given to photographers generally, that their pictures would be conveyed carriage paid to Manchester, provided these arrived by a certain date, was sufficient at once to bring together a fine collection of the finest photographic work in this country. Of course the expense entailed—at the outset, at any rate—is rather large; but if the undertaking is carried on as pluckily as it has been commenced, there is every likelihood that the patronage extended will recoup the Manchester Society for their ambitious undertaking.

We do not know whether to congratulate the Society more on its enterprise or its hard work. The pictures shown on the walls of the Mechanics' Institution, to the number of some four or five hundred, were all in their packing-cases on the previous Saturday; yet here they were—hung, numbered, and catalogued—one and all, by the time the first visitor entered on Tuesday. The well-known energy of Mr. W. J. Chadwick, the honorary secretary, must have been taxed to its utmost to secure such a successful issue of affairs, and yet he had organised an efficient lantern display into the bargain, to vary the attractions of the evening, as if undertaking the executive duties of such an enterprise were but a matter of course. Mr. Chadwick, fortunately, has several good men and true to stand by him; there was the president, Mr. E. Leader Williams, C.E., who, during the course of the evening, gave a neat little lecture upon photography, summarising quickly and succinctly the changes that have led to the present advanced state of the art. He touched upon the invention of the camera and the discovery that so-called "horn-silver" blackens in light, and, given these two discoveries, it was but a matter of time that the art of photography should come forth. The Manchester Society, the President said, was established in 1855, and since at the present moment there were no less than one hundred members, the Society might be deemed in a flourishing condition. Mr. Leader Williams concluded his happy little sketch of photography by alluding to the impetus given to the art by gelatine, although he would not say that the other and older methods would be forgotten yet awhile.

Mr. Alfred Brothers, F.R.A.S., V.P., the president of last year, also distinguished himself by bearing no light share of the work connected with *soirée* and exhibition, as did other of the vice-presidents, Mr. J. W. Leigh, Mr. A. Coventry, and Mr. John Chadwick. The Rev. Canon Beechey, M.A., another vice-president, whose name is a household word to old dry plate workers, did not, to the infinite regret of many, exhibit any of his works, but this oversight on the part of one of the most prominent members of the Manchester Society will probably be obviated during the next few days. Of the Council, we saw many familiar names on the walls, showing that they omitted nothing to contribute to the éclat of the gathering.

The hall of the Mechanics' Institution is a fine apartment, not quite so spacious, perhaps, as the Pall Mall Gallery, but still with as much wall space, since there are galleries running round three sides of the room. Every picture of note that proved attractive at Pall Mall is to be found, together with many productions of the present and last years of the members of the Society. Robinson's charming pictures, "The Old Boat" and "Her Ancestor," are here, and so, too, are Dixon's animals. "The Signal," of Messrs. Chaffin and Son, and "Mabel," of Messrs. Day and Son, now endowed with increased attraction since they secured medals at Newcastle, are to be seen, together also with Mr. Sutcliffe's picture that received the silver medal at the Swan competition. Mr. Abel Lewis also shows, and so, too, do Mr. Debenham, Mr. Harvey Barton, Messrs. Annan Brothers, the Autotype Company, Mr. Herbert B. Berkeley, Mr. Brownrigg, Mr. Garrett Cocking, the School of Military Engineering, Mr. Diston, Mr. Donald, Mr. Gillard, the Hon. Mrs. Holden Hambrough, Mr. J. Hubbard, Messrs. Hunter and Sands, Mr. H. N. King, Mr. R. Keene, Messrs. Marion and Co., Messrs. Marsh Brothers, Mr. J. M. Nisbett, Mr. Sylvester Parry, Mr. and Mrs. Payne, the Platinotype Company, Mr. A. Pringle, Mr. Lyddell Sawyer, Mr. Robert Slingsby, Mr. E. Soutter, Mr. Thom, Mr. G. Tuohy, Messrs. Valentine and Son, Capt. Verney, the Woodbury Company, Mr. F. York, Herr Artmann, Herr Emil Seelig, &c., &c.

Mr. William England sends his glacier and Swiss scenes; Mr. W. Bedford his sweet sketches of leafy England; Mr. Robert Faulkner the three delightful sketches in red of the daughters of the Prince of Wales, &c.; Professor W. F. Donkin contributes the fine Alpine panoramas he showed at Pall Mall this year; Mr. Vernon Heath sends several of his majestic tree studies; Messrs. Hills and Saunders exhibit the marvellous "Dropping Athlete" and "The Flower Girl," one of the gems of the London exhibition; Mr. F. Hollyer has some charming platinotype drawings and sketches; Mr. Baynham Jones forwards a collection of calotypes, and other interesting work; Dr. Morton sends his views of North Wales; and Mr. W. D. Sanderson, whose name was so familiar times agone in the yearly catalogue of the London Exhibition, is represented by some magnificent landscapes; Mr. E. Whymper's Cotopaxi collection is here complete. Indeed, to sum up in a few words, all the leading works of the leading photographers appear to be represented at Manchester.

To turn to the Manchester Society itself, it is a pleasure to find its members holding their own in company with the best men from all parts of the country. The President himself is to the fore, two pictures at least in the collection being worthy of high praise, namely, a sand-cart drawn by three horses, every animal not only sharp and clear, but depicted with much softness and harmony; and a Worcestershire cottage, with lichen-grown roof and quaint wooden timbers, standing in the midst of graceful foliage, which is a still better picture, and unites good art with good photography. If it was not polite to sky the President's pictures, it certainly was politic; for no dissatisfied exhibitors can complain to him of favouritism among the hangers under such circumstances. Mr. Alfred Brothers, who will be remembered in connection with the Astronomical Expedition to Sicily ten years ago, shows several carbon portraits, life-size; they are bold and vigorous without being hard, and exhibit rare taste in posing. Mr. J. W. Leigh shows some charming woodland scenes, "Worsley Lane" being especially good; there is a pathway and bridge, leading into a sylvan paradise, the clear lighting of the wood being managed with consummate skill; the "Lledr Valley—Evening" is not less successful, the whole tone of the picture being soft and subdued, while among the softly limned vales in the distance the brown shadows of evening are falling. "Dove Dale" and "Miners' Cottages" are also fine pictures. Another worthy contributor is Mr. J. W. Wade, who, besides many bright lantern transparencies, shows a whole series of good landscapes, some of them reminding one of Mr. Bedford's work, they are so soft and yet so vigorous. Mr. W. G. Coote, the hon. treasurer, exhibits several magnificent views of the rocky coast around the Isle of Man; there is not a bad picture among them. Mr. William Blakeley has views from the same district, and, better still, some lively sketches of the Mersey, the busy stream filled with tug-boats, American liners, and other craft. Mr. J. W. Bull shows a fine study of cattle; it is well composed and well executed. Mr. J. W. Chadwick, the honorary secretary, exhibits a series of lantern slides, some of which were projected on the screen with splendid effect by the secretary himself; several examples were tinted, and as tinting is usually a failure, we may remark that Mr. Chadwick's coast pictures off the Isle of Man, in which blue waves and white breakers are mingled, were simply perfection.

Mr. Thomas Chilton shows several clear and vigorous views of North Wales scenery, taken on gelatine plates of his own preparation—by-the-bye, we must apologise to the President for omitting to state that in the results he exhibits of various processes, the plates are also of his own preparation—and Mr. Chilton also exhibits "Snow Scenes, Whalley Range," which we find we have marked in our catalogue as "very nice."

Mr. J. H. Lynde shows an excellent picture of "A White Hunter," an enlargement from a cabinet. Despite the enlargement, the white silky skin of the animal is perfect, and while not a hard high light is present, there is yet plenty of brilliancy. Every powerful muscle and vein seems to show in the well-bred animal. "Stoneleigh Deer Park" is one of the most successful of Mr. R. O. Milne's exhibits—a rustic dwelling amid summer foliage, with steps leading to a woodland path, overshadowing which are leafy branches of oak and beech. Mr. Milne practises mounting his prints on glass with gelatine, which imparts to them a semi-transparent, or, rather, opaline, character that is very delicate and pretty. "Coniston Lake, from Lake Bank," is a good specimen of Mr. Alfred Pettitt's artistic work, and "Friar's Crag, Derwent Water," is another.

Messrs. J. B. Dancer and Co. show a series of pictures taken in Norway by the aid of the midnight sun, the most interesting of which are those of the coast around North Cape and some groups of Laplanders. Mr. J. Ingham has several meritorious landscapes, and one portrait—that of a little boy—which is particularly pleasing. Mr. E. Senior's little sketches, entitled "Gleanings from the Farm," are also deserving of praise.

Mr. John Pollitt has several good interiors, and also some copies of etchings. Mr. Pollitt likewise exhibits some interesting enlargements from Piazzi Smyth's Great Pyramid negatives, exceedingly well done. The bits of foliage called "Nooks and Corners," by Mr. G. F. Powell, deserve a word of praise; and so do Mr. A. Pumphrey's little photographs. A picture of foliage, a feathery spray of bright leaves in contrast with a bough of dark foliage overstretching a bit of water, by Mr. W. Wainwright, jun., we must not forget to mention, since it is one of the most tasteful photographs we remember to have seen; while a weird result enough in portraiture—or rather, in *genre* photography—is shown by Mr. Henry Wheeler, whose clever "Mother Shipton" occupies the centre of a frame of good work. Mr. C. K. Dalton has some excellent little sketches of Welsh and Yorkshire scenery. Mr. Horsey, among other things, shows some photographs of fireworks, of which the rockets are particularly good.

An apparatus for spreading emulsion on plates, together with a tiny bucket for ladling and measuring the liquid, is one of the neatest little appliances exhibited; it is shown by Mr. James Young, the apparatus being not unlike that suggested by Colonel Dawson, C.B., in these columns a few months ago. Mr. Young also shows an apparatus for graduating exposure. Mr. Pumphrey exhibits a small apparatus for carrying one hundred sensitive bromide films. Messrs. Hunter and Sands show an instantaneous shutter, constructed, seemingly, on the suggestion made by Mr. Noton some eighteen months back. A tiny pocket-camera, designed by Mr. Warwick Brooks, for one-inch plates and a gem lens, is also deserving of attention.

The room, large as it is, was so crowded with visitors at the time of our visit, both hall and galleries, that we fear the work of a few deserving contributors has passed unnoticed. If we can spare time to pay another brief visit we shall do so, if only to note our shortcomings. Meanwhile, we have said enough to show how successfully the Manchester Society have managed their Exhibition, which, we repeat, combines not only the cream of the London Exhibition, but many additional exhibits of a high order. Manchester is exceedingly happy in having in its midst so energetic a Society, governed by spirited officers, who have neither spared expense nor trouble in carrying out a happy idea. Their reward is one of the most successful exhibitions of recent times.

THE THOROUGH WASHING OF GELATINO-BROMIDE PLATES.

Comparatively few who practise the gelatino-bromide process thoroughly appreciate the great importance of effectually rinsing every trace of sodium hyposulphite from the film; neither is the circumstance that soluble matters can only be removed from a gelatine film with extreme slowness so universally known as it should be. Another circumstance steps in to increase the practical difficulties of the situation as regards the thorough washing of gelatine negatives, and this is the varying hardness and thickness of different films. It may be, for example, that a given gelatine film can be thoroughly and sufficiently freed from hyposulphite by a washing of five minutes under a tap or in running water, while another plate may, owing to greater hardness of the gelatine, or to this circumstance combined with extra thickness of the film, require a washing of no less than half-an-hour under similar circumstances.

The imperfect removal of the fixing salt leads to mischief in many ways. As the gelatine becomes partially dry, the hyposulphite acts on the image, either considerably weakening it, or merely changing its colour towards a reddish-brown tint, according to the proportion of hyposulphite left in the film: while in many cases a slight brown tint simultaneously arises on the transparent parts of the plate; the printing vigour of the negative being thus doubly reduced. Even if no considerable change of colour has been effected by the presence of hyposulphite, it often happens that a negative is rendered permanently unfit for intensification by the presence of even a minute trace of hyposulphite.

Apart from the specifically injurious action of sodium hyposulphite on the actual image, the continual tendency of an imperfectly washed negative to remain damp often leads to its destruction, either by causing it to absorb silver from the printing paper, or, if the plate be varnished, the damp condition of the film frequently leads to a complete breaking up of the resinous coating.

In order to be secure against those disadvantages above mentioned, and also other sources of trouble, the only way is to make it a rule to give every negative a sufficiently prolonged washing to remove all traces of hyposulphite, even should the film prove thick and hard. Two very effectual apparatus for thoroughly effecting the washing of negatives have been devised by Dr. Fol, and will be described in our next week's issue. The second apparatus is especially ingenious, as it imitates in a very curious and perfect manner the action of the human hand in washing a plate under a stream of water.

If photographers would take care to thoroughly wash their gelatino-bromide negatives, we should hear much less of failures and difficulties in connection with the process.

◆

ON MAKING AND REGARDING RULES.

Many persons commence business in a haphazard way, thinking that when it has developed it will be time enough to settle on a definite course of action; and it may be remembered in the very early time of silver printing, even the numbering of negatives was scarcely deemed of any great importance, and not until immense confusion and innumerable mistakes occurred by this indifference was the necessity of the greatest accuracy and precision in this respect apparent. At the present time, when the photographic art has become a settled and acknowledged business, there can be no excuse for want of method, as there might have been at first, when the practice of photography was something standing entirely apart from ordinary business.

Everyone, on commencing business, having duly considered the peculiarities of his position, the class of customers he may expect, and style of business he purposes carrying on, should establish a certain line of conduct to govern his intercourse with customers as regards the treatment of sitters; while it is highly important that every attention should be given to their wishes, no deviation should be made from the rules laid down for the management of the photographer's establishment.

Thus, if the rule is that the business is a ready-money one, no amount of persuasion should induce the photographer to relax the rule, and grant to Mrs. Charlotte Jones what he has denied to Mrs. Josiah Robinson. Firmness is needed. Often one is tempted to say, "In this instance I will give way"; but, unfortunately, having given way once, paves the way for many more lapses, and it is almost impossible to regain the ground lost by even one deviation from an established rule. Nothing but a consistent uniformity of treatment will do, giving the same amount of consideration and firmness to every customer. Visitors to a gallery will generally respect the consistent carrying out of rules, the necessity for which is explained to them, and shown to be beneficial to both photographer and customer. It is neither just to others, nor prudent in our own interests, to carry on business without having the necessary firmness to adhere to what our deliberate judgment has caused us to consider desirable.

In the keeping of appointments, it frequently happens that the intending sitter is behind time—so much so, as to closely trench on the next appointment. In this case, the reception room attendant will probably endeavour to hurry the preparations for the sitting. The visitor, desiring to have the picture taken, becomes flurried, perhaps (if a lady) omits to add some ornament, or make some arrangement in her attire that she considers important, and is hurried into the glass house, where, if the sitting is made, either an unsatisfactory negative has to be put up with, probably necessitating a re-sitting, or else causing the detention of the punctual sitter while another negative is being taken; most likely terminating in both sitters being dissatisfied, and the operator's equanimity upset for the day. Appointments should not be made for less than half-hour intervals, and the necessity for punctuality enjoined at the time the appointment is made. If, unfortunately (as may happen), one sitter is so unpunctual as not to leave reasonable time for taking the picture before the next sitter is due, prefer to make another appointment, or suggest waiting on the chance of an interval of sufficient length to do justice to the sitting; it will generally be found the first loss (of time) is the least.

One is sometimes too anxious to make all the sittings possible in the day, when our aim should be to make all the sittings successful. Work hurriedly done is seldom well done, and if not well done, had been better left undone.

Whilst punctuality is enjoined on the visitor, it must also be enforced on the employés in the establishment, from the the highest to the lowest, especially as, in most cases, business in England is neither commenced so early nor carried on so late, as to make the hours of attendance a hardship, and no laxity should be permitted. If the time of commencing business is 9 o'clock a.m., let it be 9, not 9·15, soon to be 9·30.

It is well to let it be very clearly understood that you expect punctuality, and do not overlook carelessness in this respect; and when business permits of it, give such member of your staff as can be spared, a few hours in the day, or allow them occasionally to leave earlier in the evening, a boon that will be greatly valued by them, without entailing any loss of discipline.

In the palmy days of photography (as a money-making business) the successful artist developed a large capacity for enjoyment and taking life easily, and it was not an infrequent occurrence for the head of an establishment to make his first appearance in business at half-past eleven or twelve o'clock in the morning, sometimes to find an old customer or particularly faddy person waiting to see him, having refused the attention of every one in the place, and evidently determined to treat only with the principal; the result in many cases was disastrous in the extreme.

If, therefore, the head of a business is really desirous of ensuring success, it would be well that the rules he has laid down for the government of his subordinates should be followed by himself; for the master's example will shame the indolent and encourage the energetic.

◆

At Home.

MESSRS. WINTER BROTHERS IN VIENNA.—ENLARGEMENTS UPON CANVAS.

We had seen so much second-class work in the nature of photographic enlargements upon canvas, that we did not feel at all enthusiastic when our friend Dr. Eder proposed a visit to Messrs. Winter's establishment. We suppose something of the sort must have appeared in our face, for he added, "Well, do me the pleasure to come, at any rate; if you are not delighted, you shall denounce me as I deserve." We went, and we were delighted.

Messrs. Winter—for we had the pleasure of meeting both brothers—are at the present moment engaged in rebuilding their premises, or, rather, adding thereto a large studio and a handsome suite of reception rooms. Their working establishment was, however, in full swing at the time of our visit, and Messrs. Winter unreservedly conducted us through every portion of it. On the upper floors, in half a dozen different rooms, were artists engaged upon painting the canvases; upon their skill it is not necessary here to dwell, for in Messrs. Winter's establishment, as everywhere else, you can engage good artists if you will only pay them. Our business is strictly with the photographic portion of the work, and to a description of this we shall confine ourselves.

Imprimis, however, we must describe what it is Messrs. Winter set themselves to do. It is this. They say to photographers in general: If you will send us a portrait, either negative or positive, we will produce you an enlargement on canvas worked up in monochrome. The success of their undertaking lies in the circumstance that they do not produce coloured work—or, at any rate, it is exceptional on their part to do so—but devote their efforts to the production of an artistic portrait in brown or sepia. In this way they can make full use of the dark brown photograph itself; there is less necessity for tampering with the enlarged image, and natural blemishes in the model itself may be softened and modified, without interfering much with the true lines of face and features. The monotone enlargements of Messrs. Winter, again, exquisitely as most of them are finished, do not appear to provoke the opposition of the painter; they do not cross his path, and hence he is more willing to do them justice. Many a would-be purchaser has been frightened out of his intention to buy an enlargement by the scornful utterance of an artist friend about "painted photographs," and in these days of cheap club portraits there is certainly much risk of good work falling into disrepute. But a well-finished portrait in monotone disarms the painter, and he is willing to concede that the picture has merit.

"We cannot use English canvas, or 'shirting,' as you call it," said one of our hosts; "it seems to contain so much fatty matter." The German material, on the other hand, would appear to be fit for photography as soon as it has been thoroughly worked in hot water and rinsed. Here, in this apartment paved with red brick, we see several pieces of canvas drying. It is a large room, very clean, here and there a washing trough, and in one corner two or three large horizontal baths. The appearance is that of a wash-house, except that all the assistants are men, and not washerwomen: there is plenty of water everywhere, and the floor is well drained to allow of its running off. We are to be favoured with a sight of the whole process, and this is the first operation.

Into one of the horizontal baths, measuring about 5 by 4 feet, is put the salting solution. It is a bath that can be rocked, or inclined in any direction, for its centre rests upon a ball-and-socket joint. It is of *papier maché*, the inside covered with white enamel. Formerly, only bromine salts were employed, but now the following formula is adopted:

Bromide of potassium	3 parts
Iodide of potassium	1 part
Bromide of cadmium	1 ,,
Water	240 parts

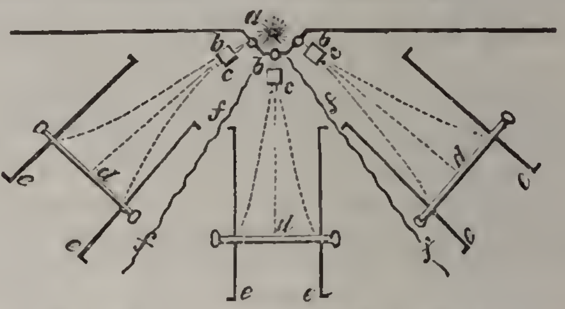
Four assistants are required in the operation, and the same number when it comes to sensitizing and developing, all of which processes are commenced in the same way. The bath is tilted so that the liquid collects at one end, and near this end two assistants hold across the bath a stout glass rod: then the canvas is dipped into the liquid, and drawn out by two other assistants over the glass rod. In this way the canvas is thoroughly saturated, and, at the same time, drained of superfluous liquid.

The canvas is hung up to dry; but as some time must elapse before this particular piece will be ready for sensitizing, we proceed with another canvas which is fit and proper for that process. The room, we should have mentioned, is provided with windows of yellow glass; but as there is plenty of light nevertheless, the fact hardly strikes one on entering. The sensitizing, with a solution of nitrate of silver, is conducted with a glass rod in the same way as before, the solution being thus compounded:

Nitrate of silver	4 parts
Citric acid...	1 part
Water	140 parts

Again the canvas is dried, and then comes its exposure.

This is done in a room adjoining. We lift a curtain and enter a space that reminds one of the underground regions of a theatre. There are curtained partitions and wooden structures on every hand, dark murky corners combined with brilliant illumination. Messrs. Winter use the electric light for enlarging, a lamp of Siemens' driven by a six-horse power engine. The lamp is outside the enlarging room, and three large lenses, or condensers, on three sides of the light, permit the making of three enlargements at one end at the same time. Our rough sketch gives an idea of the disposition of affairs (see fig.).



The condenser collects the rays, and these shine into a camera arrangement in which the small negative is contained. The enlarged image is then projected, magic lantern fashion, upon the screen, to which is fastened the sensitized canvas. The screen in question is upon a tramway—there are three tramways and three screens in all, as shown in our sketch—and for this reason it is easy to advance and retire the canvas, for the purpose of properly focussing it.

Even with the electric light now employed, it is necessary to expose a considerable time to secure a vigorous impression. From ten minutes to half an hour is the usual period, determined by the assistant, whose experienced eye is the only guide. We should estimate the distance of the cameras from the enlarging apparatus to be about fourteen or fifteen feet in the instance we saw, and when the canvas was taken down, a distinct outline of the image was visible on its surface.

By the way, we ought to mention that the canvas is in a decidedly limp state during these operations. It has just sufficient stiffness to keep smooth on the screen, and that is all; the treatment it has received appears to have imparted no increase of substance to it. Again it is brought into the red-brick washing apartment, and again treated in one of the white enamelled baths as before. This time it is the developer that is contained in the bath, and the small limp tablecloth—for that is what it looks like—after being drawn over the glass rod, is put back into the bath, and the developing solution rocked to and fro over it. The whiteness of the bath lining assists one in forming a judgment of the image as it now gradually develops and grows stronger. Here is the formula of the developer;—

Pyrogallic acid	10 parts
Citric acid	45 ,,
Water	410 ,,

The developer—which, it will be noted, is very acid—is warmed before it is used, say to a temperature of 30° to 40° C.; nevertheless, the development does not proceed very quickly. As we watched, exactly eight minutes elapsed before Mr. Winter cried out sharply, "That will do." Immediately one of the assistants seizes the wet canvas, crumples it up without more ado, as if it were dirty linen, and takes it off to a wooden washing trough, where it is kneaded and washed in true washerwoman fashion. Water in plenty is sluiced over it, and after more vigorous manipulation still, it is passed from trough to trough until deemed sufficiently free from soluble salts to tone. The toning—done in the ordinary way with gold—removes any unpleasant redness the picture possesses, and then follows the fixing operation in hyposulphite. As canvas is more permeable than paper, these two last processes are quickly got through.

The final washing of the canvas is very thorough. Again it is treated with all the vigour with which a good laundry-maid attacks dirty linen, the canvas, in the end, being consigned to a regular washing-machine, in which it is systematically worked for some time.

When the canvas picture at last is finished, it presents a very rough appearance, by reason of the tiny fibres that stand erect all over the surface. To lay these, and also to improve the surface generally, the canvas is waxed; the fabric is stretched, and a semi-fluid mass rubbed into it, heat being used in the process, which not only gives brilliancy, but seems also to impart transparency to the shadows of the picture. The result is a pleasant finish, without vulgar glare or glaze, the high-lights remaining beautifully pure and white.

Of course, the price of these canvas enlargements varies with the amount of artistic work subsequently put upon them; but the usual charge made by Messrs. Winter for a well-finished life-size portrait, three-quarter length, is sixty florins, or about £5 sterling as the exchange now stands. Besides working for photographers, Messrs. Winter are reproducing a large number of classic paintings and cartoons by photography on canvas in this way (some of them almost absolutely untouched), and these, as may be supposed, are finding a very large sale among dealers. Such copies must necessarily be of considerable value to artists and collectors, and altogether it would seem that Messrs. Winter have hit upon a novel undertaking, which bids fair to make them a handsome return for the outlay (large as it undoubtedly has been) made upon their Vienna establishment.

The "By-the-Bye" next week will be "About Photo-Lithography;" the following "At Home" will be "Herr Lowy in Vienna—The Lichtdruck Process in Detail."

AMMONIUM BROMIDE: IS THE EQUIVALENT 98 THE RIGHT ONE?

BY JAMES YOUNG.*

So long ago as 1876, Mr. L. Warnerko communicated to the Photographic Society of Great Britain the result of his researches "On the Influence of Certain Bromides on Collodion Emulsion," published in the Photographic News for February 25th, 1876 (page 85). Mr. Warnerke therein states:—"I will scarcely surprise anybody when I say that the most carefully-calculated combining proportions of silver and different halogens, based on theoretical equivalents, will give most inaccurate results, because commercial samples of those salts have different practical and theoretical equivalents."

The tables in connection with Mr. Warnerke's investigations show that one grain of ordinary commercial ammonium bromide combines with one grain and eight-tenths of silver nitrate, instead of one grain and seventy-three hundredths—the theoretical equivalent.

That this very considerable divergency between the true and the theoretical working capacity of ammonium bromide is of considerable importance to the gelatine emulsionist may be shown by the following example:—Sixty grains of ammonium bromide being used to form an emulsion, the theoretical equivalent 98 gives 104·04 grains of silver nitrate for complete conversion; whereas the practical equivalent, 94·444, shows that 108 grains are required. It will readily be seen what real danger there is in thus groping in the dark, especially to those who use what they consider a slight excess only of soluble haloid, which, after all, from want of necessary information, may turn out to be a deficiency, producing fog in all its various phases.

From the foregoing considerations I think it were well that a note of warning should be sounded, if only to induce emulsionists to test the chemicals they use, and so avoid relying for their information on the theoretical equivalents, which Mr. Warnerke's tables show to be unreliable for other bromides besides ammonium.

I may here state that I have verified Mr. Warnerke's figures for ammonium bromide a great many times with ammonium salts produced in various places, both in town and country, and always with the same result. Ten grains of $NH_4 Br.$ × 18 grains of $Ag NO_3$, when suitably combined, leave not a trace to the most sensitive test of either free silver or free bromine.

I have no hesitation, therefore, in adopting 94·444 as the practical working equivalent of commercial ammonium bromide, nor would I hesitate to alter Mr. W. Ackland's tables so far as ammonium bromide is concerned.

Table I.

	Write	Instead of
For acting equivalent of ammonium bromide	94·444	98.
For weight of silver nitrate required to convert one grain of ammonium bromide	1·8	1·73
For weight of ammonium bromide required to convert one grain of silver nitrate	·555	·576

Table II.

One grain of ammonium bromide can be replaced by potassium bromide	1·261	1·215
One grain of potassium bromide can be replaced by ammonium bromide	·792	·823

In Table II. the potassium salt is taken as being correctly represented by the numerical equivalent, 119·10. Mr. Warnerke's tables, however, show that, like ammonium, this salt has a different working equivalent, namely, 125·971.

FRENCH CORRESPONDENCE.

Photographic Society of France—Chronometric Shutter—Three Prints of Same Portrait on Same Plates—Photographic Opera Glass—Negatives on Morgan's Paper—Tartaric Acid in Sulphate of Iron Solution—Porcelain Plates instead of Enamelled Copper—Portable and Economical Lantern—Intensifying the Gelatino-Bromide Negative—Chambre Syndicale.

Opening of the Session of the Photographic Society of France.—The first meeting of the session of the Photographic Society of France was held on the 4th of November last. It was well attended, and the agenda paper a very attractive one, as will be seen on a consideration of the principal communications that were made.

Chronometric Shutter by M. Paul Boca.—One of the most important of these communications was that on the subject of M. Paul Boca's chronometric shutter, of which mention was made in the Notes of the last number of the Photographic News (page 535). For a considerable period of time many newly invented shutters have been presented to the public, but with very few exceptions—such, for instance, as Cadett's shutter with graduated motion—they were wanting in one essential particular, namely, the power of measuring the duration of the exposure. In my previous letters I have endeavoured to state the problem required to be solved. I have shown that we require a shutter capable of producing varying exposures, from that of the smallest fraction of a second, to one extending over a number of seconds. This problem has now been successfully solved by M. Paul Boca, who has had in the execution of his designs the able assistance of his friend Colonel Sébert, and of his constructor M. Rédier, well-known for the accuracy of the instruments made in his workshop. The apparatus in question consists of a sheath carrying the lens, behind which the two aluminium flaps of the shutter are made to work; below the lens there is a disc on which a needle can be set to mark the required time of exposure. The disc is graduated to one-hundredth of a second, and the circumference is divided into three arcs, each one of which represents a second. The needle moves round the disc in three seconds, departing from zero, and returning to the same point. By means of this needle the chronometer is wound up—that is to say, the spring is set, whose tension is regulated by a lever escapement; in this way the motion of the needle is arranged so that it passes over a third part of the disc in exactly one second, or in fractions of a second when it is set to stop at the divisions which mark fiftieths of a second. Such an exposure can be arranged to vary from a few fiftieths of a second, and by successive fiftieths, up to five seconds. Above that period the time can be taken without appreciable error by means of a watch. Let me add that this instrument is admirably finished, and that it will be found to be of great value to those who endeavour to work with minute accuracy, or to those who are making experiments of a comparative kind. Photography has long stood in need of such an instrument of precision, and I am glad to be able to recommend this ingenious invention of M. Paul Boca as a great improvement on the instantaneous shutter with which we are already acquainted. No doubt the instrument is capable of being still further improved, probably by affording it the means of measuring even more rapid movements. At present we can accurately measure with it exposures of a fiftieth of a second, but it is probable that we shall require still greater rapidity, so that we may be able to estimate exposures up to the five-hundredth part of a second. I believe that this might be arrived at by attaching to the mechanism an electro-magnet by whose attractive force the second flap of the shutter will be finally closed, and its rapidity accelerated in the proportion of one-fiftieth to one five-hundredth of a second. The action would be the same as in the former case, except that when very great rapidity is necessary, an iron armature would be attached to the second flap, so as to render it susceptible of the attraction of an electro-magnet, which would replace the pneumatic pear, and set the action going. Meanwhile, however, I cannot too highly recommend an instrument of this kind, both to amateur and professional photographers; it will be only necessary to know accurately beforehand what is to be the length of the exposure, in order to set the instrument so as to obtain that exposure mechanically.

---

* A communication to the Manchester Photographic Society.

Three Prints of the same Portrait on the same Plate, by M. Audra.—Is the fashion of Siamese portraits to return again? If so, it will be with an increase in their number, since M. Audra has devised a method of taking on the same print the same portrait, not only twice, but three times, in different positions. The means by which he effects this consists in employing a black background without any alteration in the arrangement of the apparatus. The sitter is posed the first time against the third part of the background (which we may consider for our purposes divided into three equal spaces), the second time against the middle part, and the third time against the last part. This background reflects no light which can act upon the plate, and, besides, the exposures are of the shortest possible duration. In the end there is obtained on a black ground three portraits of the same person with different attitudes and expression. This plan is recommended to photographers who wish to provide their customers with something else than the present commonplace style of portrait.

Photographic Binocular, by M. Germeuil-Bonnaud.—I have already had occasion to speak of M. Germeuil-Bonnaud's photographic binocular, which is an improved form of that devised some time ago by M. Geymet; this instrument was exhibited at the meeting of the Photographic Society of France. By a special arrangement it is made to serve the purpose of a theatrical opera glass, and can also be readily adapted to that of a portable camera. The only fault I have to find with this apparatus is that the shutter, in passing across the field of view, causes the camera to vibrate in a fatal manner. In this respect the instrument is capable of improvement, and the inventor will no doubt take the defect into consideration.

Negatives on Morgan's Paper.—Mr. Ancely, an amateur of Toulouse, showed some negatives taken on Morgan's gelatino-bromide paper. These negatives are of the highest excellence, and I am glad to see the old waxed iodized paper replaced by Mr. Morgan's product, which is a substance of quite different character as regards rapidity. I should like, however, to give one piece of advice to our colleague. Why does not he make sensitive films to be mounted only temporarily on paper, and capable of being taken off as required? They could then either be inverted, or they could be mounted on a more transparent support than paper. This improvement might, I think, be easily effected. I know of a paper of the kind that I speak of, and I will give him the formula for it, if he wishes to improve his sensitive paper as I have recommended.

Use of Tartaric Acid in the Sulphate of Iron Solution.—M. Ancely also brought before the Society a formula for a developing solution which can be kept exposed to the light. This is effected by adding to the sulphate of iron solution a trace of tartaric acid. The following is the formula in question:—

Sulphate of iron	... ...	250 grammes
Glucose	... ...	20 ,,
Tartaric acid	... ...	2 ,,
Water	... ...	1000 ,,

This solution is mixed with that of neutral oxalate of potash in the usual proportions. M. Frank stated that the addition of a little glycerine to this mixture will enable it to keep for fifteen days; but when Morgan's paper is used for taking negatives, the developer must be changed at every operation, in order to avoid the yellow discolouration of the paper.

Porcelain Plates instead of Enamelled Copper.—M. Védrine, an artist who has devoted himself to photography, proposes to substitute porcelain for enamelled copper. He says that this will be found to be much more economical. The specimen print on porcelain which he exhibited at the meeting was taken by a process which he did not describe, and this deprives his communication of all interest.

Portable and Economical Lantern.—A red lantern which is both portable and cheap was shown by M. Audra. It is simply a Chinese lantern made of red plaited paper. From the upper part of this lantern is suspended inside a metal plate to prevent the egress of light through the top, while allowing the current of air to pass to maintain combustion.

Intensifying the Gelatino-Bromide Negative.—*En passant*, I give an intensification formula submitted to the meeting by M. Balaguy.

Pyrogallic acid	... ...	10 grammes
Citric acid	... ...	1 gramme
Water	... ...	1,000 grammes

All traces of hyposulphite are removed from the negative, and then it is immersed in the bath given above, to which a few drops of a 3 per cent. solution of nitric acid have been added. After intensifying, the plate must be again fixed.

Proceedings of the Chambre Syndicale.—At the last meeting of the *Chambre Syndicale de la Photographie* the officers for the session 1881-1882 were elected. M. Lévy is to be president, and MM. Guilleminot and Léon Vidal vice-presidents. The programme of the examinations for the diploma of photographic assistant was read to the Society, and it was arranged to discuss it at a special meeting. There is, therefore, every hope that these examinations will confer a distinction worth obtaining by our assistants, and will raise them from the position of mere rule-of-thumb operators to that of really scientific photographers. We are endeavouring in this way to advance our art in the same manner as is being done in the photographic academy of Salzburg.

Leon Vidal.

REMOVED FROM
APR 1959
LIBRARY

Notes

The proprietors of the Alexandra Palace propose to establish a permanent photographic exhibition, to be formed each year from pictures shown at Pall Mall.

The claim of Mungo Ponton to be one of the fathers of photography has never been adequately recognised. His suggestion made in 1839—the same year Daguerreotype and Talbotype were published to the world—to employ bichromate of potash in photography, has year by year grown in importance, and to him is really due the honour of discovering that key-stone upon which stands the superstructure of all permanent printing processes—that is, with a few unimportant exceptions.

Carbon-printing, Collotype, Woodburytype, photo-lithography, photo-engraving, ceramic photography, and, in a word, all processes in which the bichromates are employed, have their source in Mungo Ponton's discovery, which, strange to say, has never been disputed. A characteristic portrait of Mungo Ponton, of whom his countrymen should be especially proud, will be the frontispiece of the Year-Book for 1882, the picture being printed by the new and very perfect photo-engraving method of Klic, of Vienna, of whose work much has been spoken, but little seen.

We sat under the blue light of Mr. Laws' gas apparatus in Newcastle, a few days ago, while that gentleman produced a portrait upon a dull November afternoon, with an exposure of from fifteen to eighteen seconds. We suffered no inconvenience from the heat, but the effect was not unlike sitting close by a roaring fire in winter time, when there seems a danger of the chimney catching fire. Mr. Laws has now used gas in his studio for two years past.

Mr. Mendelssohn, of Newcastle, whose charming portraiture is familiar to visitors at the Pall Mall Exhibition, contemplates opening a studio in town.

Major Waterhouse, the Deputy Surveyor-General of India, writes:—"I noticed in last week's News a paper by Mr. Jarman 'On the Use of Tannin in Emulsions.' I can corroborate all he says about it. I used it in India three or four years ago, and found it about the only thing that would make an emulsion workable in hot weather. I added about a grain of tannin to the ounce of solution."

Photographers, it seems, will have to pay for their models in future. On Tuesday night, at Manchester, during the lantern exhibition, one of Mr. Chadwick's clever slides was shown, in which a pier-head and two men in a boat were the principal features. "When Mr. Chadwick was about to expose," explained the lecturer, "the men sat down and rowed the boat away. 'Come back, come back!' shouted Mr. Chadwick, 'that's just where I want you.' 'I know you do,' replied one of the men from his seat, 'what'll ye give us?'"

Dr. William Huggins forwards us a careful micrometric drawing from the photographic spectrum of Comet *b*, which he succeeded in observing by means of the camera. It proves what a trusty handmaiden to the astronomer photography can be.

"Art in photography is all contained in the proper use of light and shade," said a portraitist of eminence the other day, "and duly instructed in this, photographers have little need of other education." The dictum is well worth bearing in mind, although it does not carry the solution of the difficulty very far.

The posing of children is always a difficult matter, so we may refer here to the photograph of a little boy we saw in a drawing room last week, for the benefit of any photographer who is not above taking a hint. The picture satisfied both photographic and art conditions, a rare example enough. In other words, while the photgrapher desired stillness for his work, the motive of the picture was also stillness. The boy was arrayed in a toy uniform, and, with drawn sword, was standing at "attention," while his smiling face showed how greatly he enjoyed the fun of being a mock soldier.

The photographers of Germany are endeavouring to institute yearly gatherings after the manner of our British Association, a different locality being chosen every twelvemonth. This year the meeting was at Hamburg, while the next is to be held at Eisenach, a little town hidden among the dark pines of the vast Thuringian Forest. Here are magnificent scenes for the landscape photographer, for besides the natural beauties of the district, the deep forest glades, the green mossy dells, the tearing white torrents that glitter in the black woods, there are many historical piles of interest. Rheinhardtsbrunn, where Prince Albert lived before he came to England; the old grey walls of the Wartburg, where Martin Luther translated the Bible; the Hörselberg, famed in Tannhäuser, are all within a day's journey.

This naturally leads to the suggestion, whether photography could not be tritely applied to illustrate some of the romances and legends for which Germany is so famed. In the Harz Mountains, the Black Forest, Thuringia, and elsewhere are many spots hallowed by the history of romance. The moss-grown well, with its over-hanging beeches, where the Holy Elizabeth was detected by her husband carrying food to the enemy, the meat and drink being suddenly changed into red roses when the cloth was angrily snatched from her basket; the ruins of Kyffhäuser, where the old Emperor Barbarossa is said to be still sleeping, his shaggy red beard growing right through the stone table at which he sits; the Minnesinger Chamber in the Wartburg Castle, where the tournaments of the troubadours were held—these (to give a few examples) would furnish excellent objects for the camera, whether the photographer were amateur or professional.

BALLOON PHOTOGRAPHY.

BY WALTER WOODBURY.*

Having now described shortly the mechanism of the aerial portion of the apparatus, we we will descend from our camera (kept elevated in the air by means of a small captive balloon) to the portion of the apparatus attached to terra-firma. From the sides of the hoop, at right angles to the fixed wires, is attached the cable containing three insulated wires, the ends of which are attached to the electro-mechanism of the apparatus; these wires are surrounded by, or woven into, a light hempen cord, the extra strength given by the wires not necessitating so bulky a cable as would otherwise be necessary. For the convenience of moving about from place to place, by rail or road, a small hand-cart in size and appearance, when closed, like those used by bakers in the suburbs of London, is sufficient to carry the whole apparatus and all its necessary appliances; these consist of the drum on which the cable is wound, the balloon itself, a couple of quart cell constant batteries—a form made by Latimer Clark Muirhead, and which I tried at the Paris Exhibition, from its great constancy and high electric force, being very suitable—a small projecting table carrying two push buttons, such as are used in hotels, and also the necessary appliances for anchoring the cart firmly to earth on the tent-peg system. On opening the back portion of the cart, the drum and exposing table are left free, the balloon occupying the front portion, and connected by a pulley attached to the central fixed portion of cart to the cable and drum.

We will now proceed to the operation of taking our balloon photographs, and will suppose that we wish to photograph a plate of a small town or village. The first thing to do will be to estimate the angle subtended on our plate by the lens and the extent of country we wish to include, these giving the height necessary to allow the balloon to ascend. It would be advisable to have the cable marked at every ten or twenty yards to show the height reached by the balloon. Having carefully studied the direction of the wind, and having inflated the balloon, we must now move to such a point that it will be carried, when elevated, as near as possible over the centre of our intended view. Having firmly secured the cart to the ground, the cable is now allowed to unrol itself, and the balloon, with camera attached, to rise to the required height. Now, perhaps, the most important part of the apparatus (which I omitted previously to mention) must be brought into use—I allude to a good telescope. With his eye to this, and his finger pressed on the button that closes the contact with the revolving shutter, the operator will with the former watch every movement of the camera, and at the most favourable moment release his finger from the button when the exposure shall have taken place. Merely pressing and again releasing the other button will bring another plate into position ready for a second exposure, and so on till all the four plates have been exposed. On descending the balloon, the camera can be detached, and by means of a changing-box attached to the cart, a fresh set of plates can be substituted for those already exposed.

I have said nothing about focussing the view, because it will be found that beyond a certain distance no alteration of focus will be necessary. Therefore, if the instrument is carefully focussed on any object (say half-a-mile off) it need not be altered again, and can then be definitely fixed in that position.

So far I have only instanced the taking of plans of towns, villages, &c.; but it must be apparent to all that this is only one of many uses to which such an apparatus could be applied. In case of war its uses would be manifold; the outlines of fortifications, otherwise inaccessible to the view, could be obtained, and if an army was massed, though invisible to the opposing force, any movements would be easily detected by taking a series of views at intervals. By means of a sciopticon or other form of magic lantern the image of the negative directly on development could be projected on to a large sheet of paper in a darkened room, and the principal outlines rapidly sketched in crayon, so that the results could be easily and quickly examined by those in command, and enlarged photographic images subsequently obtained for more careful reference.

Before concluding, it would be as well to glance at what has already been done in the direction of the subject we have before us; but—as I said before—this is indeed very little. The first attempts, I learn, were made by the late Mr. Negretti, during an ascent with Mr. Coxwell; but I do not know whether the results are still in existence. Nadar obtained some views of Paris, which, although not very distinct, show some of the principal buildings in that city. When in Paris during the last French Exhibition, I wished to try some experiments from the large Giffard captive balloon; but was informed that the right to do so idea.

Correspondence.

THE EXHIBITION.

Dear Sir,—Not having visited the Photographic Exhibition for several seasons through my absence from London, perhaps I may be once more allowed the Englishman's privilege.

The photographs were exhibited in such masses that they were almost dazzling in their number and continuousness. They seemed so much to require panneling-out, with relief here and there of the dead red wall, and if there could have been placed at intervals among the large ones on the upper line, some massively framed, this would have greatly relieved the terrible sameness, which would not allow the eye to single out one definite picture properly. The all-four arrangement was certainly quite inexcusable; there were some very pretty and charming little pictures put so low down that it was quite impossible to see them properly. Far better to have rejected them if the room was too small. I actually saw three enthusiastic young ladies at one time studying the humbled pictures *a la* all fours. Lastly, Mr. Editor, just between ourselves, have photographs in general—genuine, untouched, carefully executed, clean photography—advanced much in the last twenty years?—Yours truly, **Growl.**

SINGLE LENSES.

Dear Sir,—As an amateur, I have much used and still use single lenses; I have, therefore, read with much interest the different communications that have appeared in your columns on the subject of the applicability of these lenses to portraiture, and beg to forward you a specimen of the result lately obtained by me.

The lens I used for the experiment is the ordinary French single meniscus supplied with the "Scenograph" apparatus, which most of your readers probably know—it is a small wide angle glass of about $1\frac{1}{2}$ inches diameter. The enclosed portrait was taken out-of-doors; distance from lens to sitter about 32 inches; focus, 9 inches; stop, about $\frac{5}{8}$ths of an inch, the largest supplied with the lens; exposure, two and a-half seconds.

The proof is only a rough one, but I think you will agree with me that in the way of definition and depth of focus it leaves nothing to be desired. You will note that although the Scenograph is only for plates $6\frac{1}{2}$ by $4\frac{1}{4}$, the lens covers a full plate, falling off being only noticeable near the edge. Of course, it must be taken into account that the light in a studio is not so strong as out of doors; but, doubtless, the lenses could be fitted with larger diaphragms which would not interfere with the definition, considering that the greatest amount of sharpness is wanted in the centre of the plate.

Here there is a lens which for a great many purposes will answer as well as portrait lenses, costing as many pounds as this one does shillings, especially for those amateurs who, like myself, are obliged to work out of doors.—Yours truly,

A. Reimann.

PHOTOGRAPHY ON WOOD BLOCKS.

Sir,—Can anyone inform me the *modus operandi* of photography on wood blocks for the engraver to work upon, or if there are any publications on the subject? G. B.

Concluded from page 549.

Proceedings of Societies.

BOLTON PHOTOGRAPHIC SOCIETY.

THE annual meeting was held at the Baths, November 9th, Mr. R. HARWOOD in the chair.

Mr. O. Simpson was elected a member of the Society.

The HON. SECRETARY and TREASURER presented their respective reports, which were accordingly adopted.

It was resolved that, after December next, the meetings be called for 8 p.m., instead of 7.30.

The following were elected officers for the ensuing year:—

President—Mr. J. Hick.

Vice-presidents—Messrs. Harwood and Parkinson.

Secretary—Mr. C. K. Dalton.

Treasurer—Mr. Banks.

Council—Messrs. Hick, Parkinson, Dalton, Harwood, Rideout, Haslam, Banks, Hawksworth, Tong, Knowles, and Taylor.

A vote of thanks was passed to the officers and Council for their services during the past year.

Mr. HARWOOD, in acknowledgment, expressed his hope that the Society would go on prospering. From the Secretary's report he found that, while the Society had not materially increased in numbers, there was a balance in the its favour, which was much more encouraging than last year's report, which showed a balance due to Treasurer. He was also pleased to state that four papers were promised to be given early in the coming year.

The HON. SECRETARY read a communication from Captain Turton (the original of which had been sent to the Society of Great Britain), which provoked some discussion, the general tendency of opinion expressed being that there was a decided want of reliability in various commercial plates.

Mr. JOHN TAYLOR exhibited some negatives, and a number of capital prints.

The meeting closed with a vote of thanks to the Chairman.

THURSDAY EVENINGS FOR PHOTOGRAPHERS.

AT the meeting held on the 17th inst. the chair was occupied by Mr. F. W. HART.

Mr. A. J. BROWN announced that he had fitted an arrangement to a clock, which he produced, causing it to ring an electric bell at any period under an hour.

Mr. COWAN showed three prints from negatives on plates coated with the same emulsion, two of the plates having been coated with the emulsion when fresh, and the third after it had been kept for a week; all were exposed at the same time, the first and last receiving the same exposure, the second eight times that of the other two. On development it was found that while the first was very weak, the one coated when the emulsion was a week old was almost as fully exposed as the one coated with the fresh emulsion, and which had received eight times the exposure.

He also showed some vignetted portraits with fancy backgrounds printed-in direct in the camera.

Mr. HENDERSON said he had obtained the same effect on his enamelled portraits by first vignetting the picture in the camera, and then exposing it on a design, the centre of which was masked.

Mr. COWAN said he found that if a gelatine negative be slightly rinsed after removing from the hyposulphite, and then soaked for half an hour in a solution of chrome alum, it may be washed with boiling water without injury to the film. He was not aware of any decomposition likely to take place between the hyposulphite and chrome alum.

A discussion on the preparation of chloride of gold and toning baths then took place, in the course of which Mr. HENDERSON said he preferred to make his own chloride; and the CHAIRMAN shortly described the manufacture of chloride of gold, and said he used eight grains of gold for fifteen sheets of paper; he used an acetate bath, preparing it two days before he required to use it.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held at the Manchester Mechanics' Institution, Princes Street, on Thursday, the 10th inst., Mr. A. BROTHERS, F.R.A.S., in the chair.

The minutes of the previous meeting were read and passed.

The following gentlemen were duly elected members:—Messrs. George Grundy, W. W. Dawson, Lewis C. Morgan John Tonge, and Edward Eccles.

Mr. JAMES YOUNG then read a paper entitled "Ammonium Bromide: Is the equivalent 98 the Right One?" (see page 557). A very interesting discussion followed, terminating in a vote of thanks to Mr. Young.

The remainder of the evening was devoted to matters connected with the *soirée* and exhibition, which took place on November 22nd, and is to continue open for a week.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

ON the evening of the 11th inst., the Exhibition of the Photographic Society of Great Britain was open in aid of the Photographers' Benevolent Association. The gallery presented a very animated appearance, being well illuminated, the number of visitors attending being in excess of any previous occasion.

It is hoped that photographers are at last beginning to appreciate the efforts of those persevering officers who have for so long struggled under circumstances which it is difficult to understand where the objects of the Association are so thoroughly deserving—viz., "To assist members, their wives, and children when in distress through sickness, death, or want of employment, by means of immediate grants of money, to grant pensions to aged members, and to aid the unemployed members in obtaining situations."

Any further information desired can be obtained from the Secretary, at 181, Aldersgate Street, E.C.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THIS Association has arranged to hold several popular entertainments, and the first was held on Friday evening, 17th inst., in the Hall of the Young Men's Christian Association, which was filled by a highly respectable audience. The entertainment took the form of an exhibition of photographic lantern slides, the views being projected upon an enormous screen on the platform, and shown by means of the limelight.

Letters were received from Lord Strathmore and Sheriff Cheyne, regretting inability to attend.

The chair was occupied by Provost Moncur, who said that this was the first of two or three such entertainments that were to be given under the auspices of the Dundee Photographic Society, and he had no doubt that they would find it to be very instructive, as well as very enjoyable and interesting. They were to be taken by means of views round the Highlands and Islands of Scotland, and as the views were from photographs, he had no doubt that they would be worth looking at. From the kind of this entertainment he had no doubt that the following ones would be equal, if not superior, to the present.

Upwards of eighty views were shown, representing many charming scenes in the Highlands and Islands of Scotland, and all were clear, distinct, and interesting. The portraits of the Earl of Strathmore, the patron of the Association, Mr. J. C. Cox, the president, and Provost Moncur, were also exhibited on the screen in the course of the evening. The views were provided by Messrs. Valentine and Sons, and their exhibition was conducted by Mr. George Valentine and Mr. G. D. Macdougald.

Mr. COLIN CALDER gave an admirable descriptive lecture, agreeably interspersed with humour and pithy anecdotes.

At intervals Mr. C. JOHNSON, the honorary secretary, played a variety of Scotch airs on the American organ. The whole entertainment was very successful.

The HON. SECRETARY announced that at the next lantern exhibition, a series of fine views of Norway and Sweden, taken by a member of the Association during a recent tour, would be thrown on the screen, illustrating the beauties of that Northern Paradise.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

Technical Meetings.

THE second Technical Meeting was held on Tuesday, June 28th T. SEBASTIAN DAVIS, F.C.S., vice-president, in the chair.

Mr. BROWNRIGG exhibited prints from gelatine negatives, and stated his views on the question of gelatine *versus* collodion. He confessed he began with an aversion to gelatine plates, but he soon found that their mystery was in the development. His object was to bring out detail in dark foliage, and it was a great comfort to his mind to find he could obtain this. Skies on collodion plates used to be a trouble; but gelatine skies were nearly always perfect; they came structurally right.

Mr. England had tried all other dry processes, but none were equal to gelatine.

Mr. Geiger had heard that gelatine plates also would not keep, but in a very minor degree. He gave full exposures when the plates were to be kept. He also found that a thickly-coated plate could be given double the proper time of exposure, if great carefulness was taken in development; and even then no more bromide was required.

Mr. Peek stated that with some commercial plates he had given exposures twenty and thirty seconds respectively; they were developed with the same developer, and there was no difference in result.

Mr. Brownrigg had had a similar experience.

A conversation arose about qualities of gelatine plates, when

Mr. T. Sebastian Davis stated that he had tried many suggestions for the manufacture of gelatine emulsion; but at present he had not found any to possess a special advantage over his ordinary method of procedure. As this offers great facilities and simplicity of manipulation, he would describe the same to the meeting. In the first instance, he digested 48 grains of Nelson's opaque gelatine in 3 ounces of distilled water for one hour, and then raised the temperature to 130° F., and, as soon as dissolved, filtered through wash-leather. In 1½ fluid ounces of the filtrate he dissolved either 58 grains of ammonium bromide or 64 grains of potassium-bromide; and into a second like quantity, 88 grains of silver nitrate. Maintaining each at a temperature of 130°, he poured them simultaneously through a glass funnel into a stone bottle with a flat side, of a capacity of about 2 quarts, and preserved the whole, by the aid of a water-bath, for one hour at a heat near to, but not exceeding, 150° F. The bottle he now laid in a horizontal position upon its flat side, and allowed to cool. After four or five hours the bottle was filled with water, corked, carefully avoiding air-bubbles, inverted, and thus the emulsion washed by suspension. The water may be changed once, and, after ten or twelve hours, poured off, and the gelatine emulsion re-dissolved, and poured, whilst hot, with constant stirring, upon 48 grains of Nelson's No. 1 photographic gelatine. To this he added one drachm of a 4-grain solution of ordinary potash alum, the whole measuring about 4 fluid ounces, filtered through chamois-leather. Keeping the emulsion at a standard temperature of about 130°, a sufficient quantity is poured through thin "swan's-down" cotton, tied to the rim of a suitable glass-holder, directly on to the surface of a levelled plate. When the films are set, the plates are stood upon their lower edges on two strips of wood in a vertical position, and so retained by slipping the upper ones into V-shaped grooves, cut into a piece of wood about one inch square, fastened at a suitable height to the side of the drying-chamber. He stated that he regarded the drawback to these and most other gelatine-emulsion plates to be the difficulty of preserving the films clear under the action of the developer when the exposure had been sufficiently prolonged to render foliage in shade properly. To accomplish this, further researches he considered to be desirable.

Mr. Payne Jennings inquired what was the experience of those present about developing a plate without wetting previously.

Mr. Mawdsley had discontinued soaking in water, as it had a tendency to form air-bubbles.

Mr. England exhibited two negatives; the one which seemed to be most exposed registered by the sensitometer a lower number than the other, which was under-exposed.

Mr. Ayres exhibited a new dark slide, the carrier being made of three thicknesses of wood, cross-grained; takes three series of plates. Also two printing frames—one on the old plan of springs pressed on to the back; the other, Mr. Ayres' plan, where the springs were fastened on to the back itself, the result being the back did not move. Also a new printing-frame, holding two negatives and two pieces of paper, the back being divided into three parts; each negative could be examined separately.

At the third Technical Meeting on Tuesday, July 28th, Captain Abney, R.E., F.R.S., vice-president, in the chair,

The Chairman introduced the subject of developers, and stated his own experience, and inquired if anyone had tried Colonel Wortley's plan of ammonia first. It gave detail with less exposure, but at the risk of fog. Also, that he thought nothing was gained by using the bromide first, but rather the reverse.

Mr. Peek remarked that in Mr. Cowan's results it kept the shadows clearer.

The Chairman observed that there was certainly a difference between his and Mr. Cowan's experiments. Mr. Cowan worked from a model in a studio, whilst he (the Chairman) worked from a landscape, where no advantage was gained from using ammonia first.

Mr. Davis was in favour of using all three solutions at once; he thought it desirable that the plate should receive the solutions at the same time. In his experience, by adding ammonia to the emulsion, fog was produced; but after the emulsion was washed (as it appeared on the plate), then one might commence with a dilute solution, and advance as required.

The Chairman had tried ammonia in emulsions in every way; it ought to be abolished. If ammonia is used after washing the emulsion, it decomposes the gelatine: he had made an experiment by coating a plate before adding ammonia; the shadows came perfectly clear, but after adding ammonia fog was produced, showing that the bromide was reduced.

A conversation arose as to the danger of using ammonia ·880 in operating rooms. Both Mr. Davis and Mr. Spiller said that their practice in the laboratory was to use it one-half strength. In the matter of testing plates, the Chairman thought that the use of a *cell*, when portions of one plate could be immersed, was better than Mr. Cowan's plan of using different negatives.

The Chairman inquired how a plate with an unknown exposure should be developed.

Mr. Davis would dilute the developer one-fourth, then add the three solutions separately; watch the result, and proceed to the finish.

Mr. Cowan would develop with the normal developer, with a good restrainer, and afterwards alter the same as required.

The Chairman thought that full pyrogallic should be used, with the bromide and ammonia diminished; develop for fifteen seconds, and if the image was correct, then use full doses of bromide and ammonia.

Mr. Spiller also agreed with this suggestion.

The Chairman then inquired if anyone had tried to develop with hydro-quinone; no restrainer was wanted; great delicacy resulted. It may be used in solution with 20 drops of a 10 per cent. solution of ammonia mixed with it. It was a little slower than pyrogallic, and had no action upon gelatine. In answer to a question as to the exact formula, the Chairman stated, in reply, that 20 grains of hydroquinone are dissolved in one ounce of water as a stock solution; then take two drachms and dilute in one ounce of water; to this add two drops of ammonia. Density could always be got if the development went on long enough. If over-exposed, use one-fourth of the ammonia, afterwards adding more.

Mr. Davis exhibited a negative prepared with Henderson's gelatine, and inquired if any one had prepared his own gelatine.

The Chairman replied that he had, but would not do so any more.

Mr. Davis then exhibited two gelatine negatives. One plate he had prepared from parchment boiled ten hours; it made very good gelatine, and adhered well to plate.

The Chairman said that cows' horns which had the gelatinous matter left in the shell made very beautiful gelatine.

Mr. Cobb inquired how hot weather affects emulsion. There must be some atmospheric condition which does affect it.

Mr. Spiller thought that the gelatine was in fault; it was quite impossible to make glue in hot weather.

Mr. Cobb asked what produced green fog.

The Chairman stated that it was not the gelatine that caused green fog. As an experiment, cut a gelatine plate in half, then develop one with pyrogallic—green fog may result; develop the other with ferrous oxalate, and no green fog will ever come: again, use plenty of bromide, and you don't get green fog; but use plenty of ammonia, and you get green fog.

The Chairman inquired if any one had tried Dr. Vogel's emulsion.

Mr. Spiller, junr., had tried it, but pin-holes had resulted; but this might possibly be owing to his having used a substratum of india-rubber.

The Chairman stated that he had made an emulsion: one part used in the ordinary way registered 25 by the sensitometer; the other part he dissolved in acetic acid, and it fell to 18.

Mr. Spiller remarked that it was difficult to get pure commercial glacial acetic acid. The inflammability of the vapour on boiling was a good test of purity.

The Chairman said that glacial acetic acid was not what it seemed to be: it was generally mixed with other acids.

Mr. Spiller said that English samples never contained butyric acid.

Mr. Spiller, junr., asked the Chairman if he had any experience with salicylic acid. If 1 grain was added to the ounce of emulsion, it acted as an antiseptic.

Mr. Spiller said that a solution of gelatine cannot be kept. Glue-makers employ a mineral salt—alum or sulphate of zinc in minute quantities. There is an impurity introduced when these acid salts are used; hence in some of the alkaline developers the free ammonia upset the alum and zinc salts.

The Chairman remarked that zinc salts were a preservative of gelatine. If bromide of zinc was substituted for bromide of potassium, a capital emulsion could be made.

Mr. Ayres then exhibited a negative, with a sky-negative fastened on the back; also a dark slide for holding plates of any size; this was effected by four screws running diagonally: also a silver safety dipper, with a screw regulator for carrying plates coated side downwards: also a frame for holding various-sized plates from which to make transparencies.

The fourth Technical Meeting was held on Tuesday, October 25th, 1881, when Captain Abney, R.E., F.R.S., vice-president, again presided.

Mr. Sands exhibited and explained his instantaneous shutter. He had adapted a new scale, suggested by Mr. Cowan, in connection with the shutter, which, when used as an ordinary shutter, gave certain previously-determined exposures. He stated that the most rapid exposure was the 150th part of a second, the longest rapid exposure being the 25th part of a second.

Mr. Davis observed that the new scale which *retained* the time of exposure would be very useful in a studio. In reply to a query, Mr. M. Whiting said that his views off Dover were taken with a drop-shutter behind the lens, acted upon by pneumatic power.

Mr. Ayres exhibited and explained a new washing-apparatus for gelatine plates where the film was kept downwards.

Mr. Sands then explained his new changing-box for changing two plates at one time, the shutter of the dark slides pulling completely out.

Mr. Cowan next explained his glass-cutting machine, which would accurately cut, from any piece of glass, the ordinary or outside sizes for photographic purposes; also another machine for cutting a piece of glass into four equal parts: in connection with this apparatus a block, fitting most accurately together, was shown of a whole plate, cut up into sixteen squares.

Mr. Walker showed a "finder," consisting of a mirror placed inside the camera at an angle of 45 degrees: this was looked down upon from an opening in the top of the camera, the image being reflected upwards, and by turning a screw this mirror acted as a shutter for the exposures.

Mr. Davis remarked that this shutter gave the sky the longest exposure.

A conversation then took place upon the various positions of shutters—as to the relative value when placed at the front or back of the lens.

Mr. Mawdsley observed that, when the shutter was placed in front of the lens, there would be a diminution of the light admitted.

The Chairman said, Mr. Paget observed, and he confirmed it, that when the shutter was close to the surface of the lens, practically it did not cut off any portion of the field of view.

Mr. Mawdsley said that a drop-shutter behind the lens did not cut off the field; in front it acted as a stop until the full aperture was disclosed.

The Chairman drew attention to the importance of a long drop. He had used a drop-shutter with an 8-in. drop, and thought the full size of aperture ought to be four diameters of the lens; with elastic bands this could be made to work in a very small fraction of a second.

In reply to a question from Mr. Sands as to the effect of a shutter between the lens, the Chairman thought that it would cut off part of the image, as in working from the optical centre it slices off the image.

Mr. Davis thought that a long aperture in passing over the lens would practically lengthen the exposure, and considered that two or three diameters of the lens was quite sufficient.

Mr. Sands considered that there would then be a loss of time in opening and shutting: he aimed at getting the opening very rapid, then getting slower, and finally closing rapidly.

Mr. Spiller then exhibited and explained "Husbands' Lamp," for changing or developing plates. He said:—"On behalf of Mr. Nesbitt, of Bournemouth, I have the honour to exhibit a very portable form of red lamp, which is intended for general use in the operating-room, but will be especially serviceable for changing plates at night during a photographic tour. The whole apparatus packs in a box of seven inches square by an inch and a half deep; it weighs only 15 ounces, and is the invention of Mr. Husbands, of Denmark Street, Bristol. When mounted for use, the lamp takes the form of a three-sided pyramid, with ruby-glass sides, and shield at top to screen off the direct rays, the source of light being a dwarf paraffine candle or "night-light" burning in a tin capsule, resting on the triangular metal plate which closes in the bottom of the lantern, the said metal plate being secured in position about half an inch above the table by turning inwards the curled feet of the apparatus. For convenience of packing, the top and bottom are taken off, and then the three sides fold in upon each other on merely drawing the pin that secures the lantern in its pyramidal form. The paraffin lights are supplied by the dozen, and will each burn for a very considerable length of time. The lamp now shown has one pane of glass rather more transparent than the others, so that in the event of more light being desired (at a safe moment), this side of the lamp may be turned towards the plate under development. Mr. Nesbitt informs me that he has repeatedly used this lamp, and finds it very convenient."

The Chairman said it was certainly a novelty: but, having had experience when travelling in using private rooms for photographic purposes, he had found nothing yet to beat a folding screen about 18 inches high; it goes into a portmanteau, and there was no danger of breakage. In consequence of using iodide of potassium in plates, he could use a yellow paper, through which the light passed. He described the screen, which consisted of a sheet of cardboard half cut through into three parts, with a flap to fall down, over which he placed one fold of yellow paper, behind which could be placed any ordinary candle; a newspaper or a board placed at the top shaded all light from the ceiling.

Talk in the Studio.

The Swan Competition at Newcastle.—Besides the exhibitors mentioned last week as having contributed good work, we may specify Mr. King, who sends a selection from the Windsor Castle series he showed in town. Mr. Abel Lewis, of the Isle of Man, besides his huge frame of instantaneous views, contributes three fine portrait studies, the composition of which is both artistic and clever. Mr. Birtles, of Warrington, is represented by some fine studies, and Mr. J. Bellman, of Whitehaven, has a goodly collection, of which we admired most a vignetted portrait of a little girl. Mr. Mountfort, of Coventry, contributes portraits; Mr. Jackson, of Silloth, four soft and harmonious landscapes; and Mr. Nisbett, among others, a cattle-study which, had the plate been more evenly developed, would have been one of the best pictures in the exhibition. Mr. McLeish has three studies, "Morning," "Noon," and "Night," of which the centre—an old man setting a violin to rights by the light of a candle—is a vigorous and most praiseworthy production. Mr. J. Pike, of Tynmouth, forwards some small prints upon gelatino-bromide paper, which prove unmistakably that this material can be put to good use for rapid printing. Mr. G. Barrow, Mr. W. Hall, of Glasgow, and Mr. D. Jones, of Liverpool, show some good portraits. Lady Mary Primrose contributes Raby Castle and Moat, a well-executed little sketch: and Messrs. Brunskill send a charming winter picture of Ferry Nat in the snow and frost. From the Elswick Ordnance Works comes a fine interior of one of the workshops, by Mr. Goold, and from Lincoln, Mr. Skill sends some good views of the Cathedral and the Roman Arch. Messrs. W. and D. Downey, of Newcastle, exhibit much fine work, especially in portraiture: the Misses Macintosh, of Kelso—three sisters, we believe—show a capital little study of three pugs, besides many portraits; Mr. Robinson, of Sunderland, has two charming little portraits of children, which represent very high-class work indeed: and Mr. J. Paton, of Greenock, besides good portraiture, contributes several Clyde sketches of high merit. Mr. Deane, of Douglas, has a good photograph of shipping, and Mr. S. Laroche, of Llandudno, shows his skill in employing the rocks of that fashionable watering-place as backgrounds. The Rev. G. S. Smith, of Felton, exhibits a picture of a snowstorm, and Dr. Berwick, of Sunderland, shows the result of a successful experiment in the way of developing a plate upwards of a year after its exposure.

South London Photographic Society.—The annual meeting of this Society will be held on Thursday next, December 1st, at eight o'clock p.m., in the Rooms of the Society of Arts, Adelphi, when the election of officers for the ensuing year will take place. Mr. T. Bolas will exhibit some of Fletcher's gas furnaces in action, and illustrate their use in melting silver or the reduction of residues. The annual dinner will take place on Saturday, December 3rd, at the Holborn Restaurant. Further particulars can be had of the Secretary.

Photographic Club Dinner.—The second annual dinner. which took place at Ashley's Hotel on the 16th inst., was well attended, and the festivities passed off to the evident satisfaction of the company. Mr. Cobb recited an original composition in verse, which was evidently much appreciated; while Mr. Payne Jennings, Mr. A. Cowan, and Mr. Cutchey, jun., enlivened the proceedings by recitations or songs. The Rev. F. F. Statham, who occupied the chair, made some apt remarks regarding the past and probable future of photography. He also made kindly speeches in connection with the various toasts proposed during the evening, and towards midnight the company dispersed, expressions of satisfaction with the events of the evening being general.

Photographic Christmas Cards.—It gives us satisfaction to observe that the use of photographic Christmas cards is notably on the increase, and we now wish to call attention to an extensive series issued by Messrs. Mansell and Co., of Oxford Street; quiet country lanes, ivy-covered churches, flowers, bird or bird-nest pictures, and yachts under sail forming the staple of the subjects selected. The neat and tasteful manner in which the cards are produced does Messrs. Mansell credit, and suitable quotations from well-known poets serve as mottoes instead of the doggerel rhymes often found on Christmas and New Year cards.

"Christmas Maidens."—A series of photographic reproductions of drawings by Edgar Hanley will afford gratification to those who have a taste inclining towards the present-day conventionalism of those who profess and call themselves æsthetics.

Photographic Exhibition.—The substitution of a film of dried gelatine for the thin layer of wet collodion, which the photographer formerly employed as a vehicle to retain the sensitive salts of silver in a suitable condition on his glass plate, has involved considerable alterations in the mechanical appliances used in photography. For out-of-doors work, or work away from home, the photographer no longer requires to carry what was practically a portable laboratory. Not having to "develop" his pictures on the spot, he need take with him neither dark-tent nor chemicals. On the other hand, he must have some provision by which his store of dry plates can be placed, one after the other, in the camera, and properly "exposed," without the risk of the slightest particle of light reaching the sensitive surface, other than the light properly directed upon them by the lens. As he wishes to carry an ample supply of plates with him, and as the glass plates themselves make an appreciable burden in a long walk, it is essential that the apparatus for carrying them should be as light as possible; hence have arisen considerable improvements in the camera and its "slides." Again, the increased sensitiveness of the gelatine films makes it possible to give exposures shorter than can be effected by the hand uncapping and recapping the lens; hence the invention of numerous "instantaneous shutters," by which exposures of a few hundredths of a second can be given, and pictures of moving objects readily secured. These are but instances of the many novel appliances which recent progress in photographic science has originated, and, besides these, there have been, during recent years, many and important improvements in the applications of photography to the production of permanent illustrations for books and newspapers. All these varied applications of the art are to be illustrated by an Exhibition of Photographic Appliances which the Council of the Society of Arts announces will be held during January and February next, in connection with a course of Cantor lectures to be given before the Society by Captain Abney.—*Daily News.*

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

⁂ The Year-Book.—We are already in receipt of several important articles for the Year-Book. Might we ask all those who still contemplate favouring us with contributions, to be so good as to forward them *immediately*?

⁂ Owing to press of matter, "In and Out," and the "Topic," are postponed until next week.

Commercial Dry Plates.—Captain Turton, R.N., forwards to us for publication a copy of a letter received by him from the Hon. Secretary of the Photographic Society, in reply to the circular which Captain Turton addressed to the Photographic Societies of Great Britain, and also to many leading photographers in this country. The circular of Captain Turton, with which our readers are familiar, complains of the uncertainty and unevenness of many commercial plates in the market, and contains a request that the subject may receive earnest attention. The reply from the Photographic Society of Great Britain is as follows:—"Dear Sir,—I am directed by the President and Council of the Photographic Society to acknowledge the receipt of your letter of Oct. 17th, and to inform you that it has been decided, after careful consideration, that to answer such questions is quite beyond the province of the Council of the Society. With regrets that you should have had the trouble of writing,—I am, dear sir, yours faithfully, L. Darwin, Hon. Sec. Photographic Society."

T. M.—It was a stupid telegraphic blunder.

Victor.—It was there, nevertheless; to quote the German proverb, "You did not see the forest, because of the trees."

J. W. Harrison.—The print is a Woodburytype, and there is nothing to prevent your practising the process yourself. The recent work of Leon Vidal on the subject—published by Gauthier-Villars, Paris—will give you detailed information.

S. W. Oakes.—Thank you; we shall not fail to make use of the information shortly.

W. E. B.—1. You had better enlarge the negative subsequently. 2. Not in the production of the original negative; it may serve very well for making the enlargement. 3. There is no treatise on the subject, neither is one required; the exercise of ordinary intelligence being all that is necessary.

H. Thompson.—Any test is likely to mislead, as the washing should be continued long after the liquors have ceased to show the reactions of sodium hyposulphite.

Subscriber (Llanidloes).—1. A generator and lamp suitable for use with your steam engine would cost about £120. 2. Mr. Swan's address is Messrs. Mawson and Swan, Newcastle-on-Tyne. 3. We should prefer to use a rectilinear or symmetrical lens.

A Subscriber (Hastings).—Mix a little lamp-black with negative varnish, and apply with a camel's hair brush, taking care that the metal is slightly warm.

A Subscriber from 1863.—We do not understand your difficulty, and should be glad of further explanation. It reads thus:—Potassium citrate, 100 grains; water, 1 ounce; ferrous oxalate, 25 grains.

Rigs.—Gum dammar, 50 grains; benzole, 1 ounce.

I. I. D.—It is probable that a considerable under-exposure is the cause of your failure.

Silver.—1. In about three weeks. 2. The state of things which you suggest is no doubt desirable, and may be realized before long.

L. T. Cameron.—It should have been exposed at least twice as long.

R. B. R.—The most important disadvantage of such a form is roundness (or concavity) of the field of sharp definition.

M. Gaun.—1. Wood-pulp is used to a considerable extent in even high-class papers, and you are quite right with respect to the darkening action of light on this when it has been imperfectly cleansed from the incrusting matter. 2. Both kinds are covered over with a gelatinous layer, but in the single transfer the coating is made very insoluble by the use of a considerable proportion of chrome alum, while the latter is only slightly hardened; a mere trace of chrome alum being sufficient. 3. In either case a white pigment may be added, but it is by no means essential. 4. It is one of the most unsuitable qualities for the purpose. Select a hard quality which sets rapidly and firmly, even when the solution is weak.

K. Sanderson.—1. You can redissolve the residue in a mixture of alcohol and ether—rather more of the latter than the former—but the use of a doubtful product of this nature is calculated to cause trouble and give rise to failures. 2. A moderate white heat is necessary.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1213.—December 2, 1881.

CONTENTS.

	PAGE
Halation	565
Spots on Carbon Transparencies and Prints	566
Photography In and Out of the Studio	566
By-the-Bye.—About Photo-Lithography	568
A Suggestion. By Alexander Cowan	569
Retouching by Artificial Light. By Rudolph	569
Notes	570
Topics of the Day.—Dark-Room Notes. By Lyddell Sawyer	571
Correspondence	572
Proceedings of Societies	574
Talk in the Studio	576
To Correspondents	576

HALATION.

Halation may be defined as the encroaching of the high-lights of a negative on the adjacent shadows, and the consequent production of a peculiar appearance of blurring in the resulting print. It probably exists to a greater or less degree in the case of every negative on glass, but makes itself apparent only where strong contrasts exist, notably in the case of interiors, where brightly-lighted windows form part of the picture.

The whole cause of halation does not appear to be generally understood. The first and most evident cause (and the one which undoubtedly gives rise to the greater part of the phenomenon) is reflection from the back of the plate—that is to say, a portion of the light which passes through the film, striking the posterior surface of the glass at an angle, is reflected from it on to those parts of the film which immediately surround the high-lights.

This defect is overcome by what is called "backing" plates; that is, spreading on the back some substance of a non-actinic colour which absorbs, and, therefore, prevents the reflection of any of the rays which would injuriously affect the film. Such a procedure very much reduces the amount of halation, but it does not entirely do away with it, and it is evident that we must look farther for the explanation of that which remains. It has been suggested that the remaining halation is chemically produced—that is to say, that by a molecular action the parts of the plate nearest the high-lights become affected; or, in other words, that the deposit of silver spreads laterally. That this cannot account for the appearance will be evident, if we consider that the effect of using paper instead of glass as a support is to make the halation practically disappear. We say practically, because it has been proved that the chemical spreading referred to does take place to a certain small extent; the proof is to be found in the fact that if a set of very fine black lines, with very narrow white spaces between them, be photographed on a sensitive film of almost any kind on a paper support, the negative will show the lines too narrow, especially if the development have been forced. In this case the silver deposit has spread laterally by chemical or molecular action; but this to so very small an extent that it cannot by any means account for the phenomenon known as halation.

We have heard it stated somewhere that the effect is produced by those rays which, being diffused from the film in all directions, strike the back of the plate at the angle of total reflection, and which consequently will not be affected by the backing. That there must be something more than this is evident from the fact that if the plate be backed with a substance having about as high a refractive index as glass, halation is still, to a certain extent, evident.

We now pass on to what we consider to be the true explanation of that halation which may still be evident even with a plate which has been backed. Glass is not an absolutely transparent substance, and of the rays which pass into a piece of it, a certain number are stopped on the way besides those which are reflected from the surfaces. Let us see what becomes of those rays which do not find their way through the glass. Some are absorbed, *but others are diffused or reflected from the substance of the glass in all directions.* Let us take a familiar instance of a somewhat similar case. The air in an ordinary room is far more transparent than any glass, and yet we know that if we darken the room, and allow a pencil of brilliant light to enter from a small hole, that the path of this pencil will be distinctly visible from all parts of the room; in fact, so much light will be given out from it in all directions, that a photograph may be taken of it, or that it will affect a sensitive film placed near, but not in it. In this case, the part of the pencil of light is reflected in all directions, or diffused by particles of dust—perhaps by vapour of water, or even by the air itself. In fact, it is the result of want of absolute transparency, from whatever cause that arises. Similarly, the path of a ray of light will make itself apparent as it passes through a large mass of the most transparent glass.

Here we see a quite sufficient cause for the comparatively small amount of halation which is left after all the effects of reflection from the back of the glass have been eliminated. Let us suppose that the halation-producing portion of the negative is a small disc of intense illumination, such as would result from having an image of the sun on the film. It will be evident from what we have said that the glass immediately behind this bright spot will be in what may be called a luminous state—that it will be dispersing light in all directions, and that some of this light will undoubtedly impinge upon the adjacent parts of the film, and produce blurring.

Let us now consider whether there is not a possible cure for this distressing phenomenon, which, when certain subjects are attempted, will make its appearance even after all that can be done in the way of backing the plates has been done. The first and most simple solution of the difficulty is to use paper as a support. We hope the time is not far distant when Mr. L. Warnerke may make this a practical matter. At present there are difficulties in the way, and it may be worth while to consider whether there is no way of getting rid of the bugbear when using glass.

From the explanation which we have given, it is evident that the only means of entirely getting rid of the nuisance is to prevent any actinic light from reaching the glass at all. There are two possible ways in which this may be done. One is to charge the film itself with some non-actinic colouring matter; another is to spread upon the plate, as a substratum, a non-actinic film. In either case the colour must, of course, be afterwards got rid of to allow printing to be accomplished.

We remember some time ago, that the proposal was made to use, for gelatine plates intended for negatives of interiors, &c., as a substratum, a film consisting of an emulsion of chromate of silver. A very small quantity of this substance held in suspension, either in gelatine or collodion, forms a deep ruby film, which would allow no actinic light to pass through. Moreover, chromate of silver is soluble in hyposulphite, and consequently the colour would clear completely away in the fixing bath. Only one hitch occurred. When the author of the idea tried it in practice, he found that the film would not withstand the ordeal of development. Metallic silver seemed to be deposited, even without the action of light, forming a dense fog.

As regards the idea, which is by no means a new one, of loading the film itself with a colouring matter, it would at first appear that such a proceeding must reduce the sensitiveness of the plate; or, at least, make it difficult to gain density on account of the fact that light could not enter thoroughly into the film. This is probably a mistaken idea. It has been proved that if a plate be coated so thickly with a gelatine emulsion that no light can penetrate the film, yet the silver may be reduced through its entire thickness during development. In fact, a surface action of light would seem sufficient, and the further reduction would appear to take place by a chemical or molecular action only—or, at least, chiefly.

Of the nature of the latter—colouring matter in the film—must be considered iodide of silver in gelatine emulsions, and we consider it by no means one of the least of the many advantages which an emulsion containing a certain quantity of iodide possesses over one of pure bromide, that if it be spread thickly it produces a film so non-actinic that little blue or violet light can reach the glass, and halation will be reduced to a minimum.

Here we must notice a curious fact in connection with the colour of a gelatine emulsion containing iodide. If it be spread very thinly on glass, so that the form of a flame can be distinctly seen through the film, it will be found during the sensitizing process, by boiling or slow digestion, to pass through all the usual gradation of colour from ruby to blue, or slate-grey; but if the film be of such a thickness that it is translucent without being transparent, the light which passes through it will appear of a deep yellow colour throughout the whole process.

SPOTS ON CARBON TRANSPARENCIES AND PRINTS.

The numerous specks and spots which trouble the carbon printer may be classed under two principal heads. In the first place, we have the various floating particles which may exist in the sensitizing bath, the air of the room in which the tissue is dried, the water subsequently employed, or the collodion which may be used. The average carbon printer does not prepare his own tissue, and he concentrates his energy on the elimination of any particles of foreign matter which may be derived from such sources as are indicated above, being contented to anathematise the manufacturer of the tissue on account of any clots or specks which he can trace to the gelatinous film itself.

Particles of unground colour, or any solid bodies which might be removed by a careful straining of the gelatinous composition used in making the carbon tissue, indicate clearly that proper care has not been taken in the manufacture, and form perfectly just cause of complaint on the part of the consumer.

Apart from the solid or insoluble particles which are alluded to above, we, in common with many others who are in the habit of making use of carbon tissue, have frequently noticed the existence of insoluble clots in the gelatinous film, these varying considerably in size; and in most cases they are so large as to entirely preclude the supposition that they can have passed through the fine straining muslin almost universally used for filtering the composition.

Some recent experiences have, however, given us a key to the difficulty. About three years ago we prepared a small batch of indian-ink tissue with extra care, the gelatinous mixture being clarified by means of albumen, and the indian-ink carefully filtered through several layers of the finest muslin. This tissue gave admirable results, the colour being fine and uniform, while its freedom from specks made it contrast favourably with less carefully-prepared samples. From time to time we used portions of this batch, the results being uniformly satisfactory until a week or so ago, when, on taking the roll out of its tin case, the outer layer proved to be spotted over with a growth of mouldiness. The defective parts were rejected, and some of the interior portions, which on cursory examination appeared to be quite free from any trace of mould, were sensitized. Development, however, revealed the presence of innumerable insoluble clots, varying in diameter from one-hundredth to one-twenty-fifth of an inch in diameter; and suspecting that these corresponded with incipient tufts of the curious fungoid growth which constitutes ordinary mould, we carefully examined some of the tissue with a low-power microscope, and found traces of budding growth on portions of the tissue corresponding to that which we had sensitized. Circular pencil-marks were made round about the points thus discovered, the marks being, of course, made on the reverse or back of the tissue. The pieces, being now sensitized and dried in the usual way, were exposed, and mounted on collodionized glass in the manner usual when carbon transparencies are being made. In each case a plain glass was laid on the mounted tissue, and the position of the centre of each pencil-circle was registered by a dot. The paper backing being now stripped, and development proceeded with, it was found that in almost every case the marks on the register-glass corresponded with insoluble black clots of the kind already referred to; the exceptions being in one or two cases where the register dots corresponded with bare glass, or the highest lights of the subject.

Having thus to our own satisfaction traced the cause of the mischief, we made a series of experiments with commercial tissues, and all these led us to confirmations of the view that insoluble clots often—and, indeed, generally—owe their origin to incipient mouldiness, or the partial development of a fungoid growth.

Insoluble clots may—and doubtless often do—arise from other causes, such as contact of the wet tissue with floating particles capable of causing insolubility, or of effecting the reduction of bichromates. It may be worth while to mention that we produced an abundant crop of such particles by rubbing together two cloths which had been moistened with a strong chrome alum solution, and dried; some damp sensitized tissue being suspended close by. A similar effect was produced by cloths charged with sulphite of sodium, and also by some which had been soaked in a bichromate solution, and exposed to light.

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Photographing on Wood—Keeping Qualities of Gelatine Emulsion—Sun's Colour—Rejlander's Pictures.

Photographing on Wood.—It is somewhat singular that amid the many attempts to make photography available for book illustration, so little attention comparatively has been paid to photographs on wood. There are, of course, ways of doing this, either by a gelatine or collodion transfer, or by printing in contact with a negative, the block having been previously sensitized. All these methods have, however, drawbacks which prevent them being successful, the chief difficulty being that the film, whatever it may be, on the surface of the block, interferes with the free action of the graver. But although there is no published formula by which perfect results can be guaranteed, there is a process now in commercial use, the finished productions of which delight the public every week. We allude to Mr. Du Maurier's drawings in *Punch*, and to many of the pictures in the *Graphic*. Mr. Du Maurier draws his pictures about ten times larger than they appear in *Punch*. They are photographed down to the proper size, and thus gain that wonderful delicacy and finish which distinguish this artist's work. But how about the photographic manipulation? We regret to say that we cannot give the information. The process, in fact, is kept a profound secret, and so far secrecy has proved a much better protection than any number of patent laws. The results of the process are certainly all that can be desired, and their clearness shows that the objections arising from the film interfering with the graver are entirely overcome. We may say, in passing, that several years ago we made some experiments in this direction, and found that printing on an albumenized block gave the best result. Architectural or linear subjects could be reproduced exactly, and worked upon by the engraver at once, without the interposition of the artist. Albumen, we found, did not peel off, as collodion is apt to do, and offered far less resistance to the knife than gelatine. Pressure of other matters, however, compelled us to lay aside the experiments. Now that illustrations and reproductions are so indispensable in periodical publications, it would be worth while for any one who had the time, to devote a portion of it in the investigation of the subject. At present it is a monopoly in the hands of one or two men.

The Keeping Qualities of Gelatine Emulsion.—A case was recently heard in the Dover County Court, which is of some importance to photographers. A Dover photographer, whose speciality is the production of "cloud" negatives, summoned a firm of photographers in Manchester for the value of certain negatives, and a quantity of gelatine emulsion, supplied on sale or return. There appeared to be no dispute as to the fact that the negatives and emulsion were sent to and received by the defendants, and the defence was that they had returned them. The plaintiff, on the other hand, stated that the negatives had never come to hand, while the emulsion, when it arrived from defendants, was quite worthless from its having been kept too long. The first hearing of the case was adjourned, in order that evidence might be adduced on the keeping qualities of emulsion. When it again came on, the defendant produced a witness whose opinion it was that gelatine emulsion, "if properly corked, would keep for unlimited time." The plaintiff, however, alleged that "it was of so perishable a nature that it should be used within a week or ten days, and that defendants knew this." The judge had thus a knotty point to decide, and could only go on the weight of evidence, which was on the side of defendants. He accordingly gave the verdict in their favour. We have nothing to say against this verdict; at the same time, we must remark that it is pretty well known that the keeping qualities of gelatine emulsion as ordinarily prepared are not good, although it is possible the experience of the defendant might have justified his statement. In the Photographic News of July 1st, we pointed out that alcoholic emulsions of gelatine possessed the advantage of keeping for months without showing signs of decomposition, but we are not aware that alcoholic emulsions of gelatine have to any extent been used in this country. Gelatine in a moist state is undoubtedly prone to change, and the safest way with emulsions is, perhaps, to use as soon as made. On the other hand, there may be circumstances under which it is desirable to prepare the emulsion for storage, instead of immediately coating plates. It would therefore be instructive to know what is the best formula for the preparation of an emulsion which will keep in a fluid state. At present very little of a decided nature appears to be known on the subject.

The Sun's Colour.—In his new publication, *Knowledge*, Mr. R. A. Proctor has been commenting upon Professor Langley's theory that the sun is in reality not a white sun, but a blue one, the apparent whiteness being due chiefly to the absorptive action of his own atmosphere, and partly to that of our own air. Mr. Proctor's observations are suggestive, because they point out the value which photographs of the sun have in relation to this interesting question. The sun, as seen by the naked eye, appears more luminous in the centre of his disc than at the edge, and the difference can only be due to the effect of absorption exerted by the solar atmosphere. Mr. Proctor thereupon remarks that anyone who studies a photograph of the solar disc will notice that the darkening toward the edge is much more marked there than it is in the ordinary photographic disc of the sun, and says: "It follows that those rays which produce the photographic image of the sun (chiefly the blue, indigo, and violet rays) are more affected by the absorption of the solar atmosphere than those which form the ordinary visual image of the sun. His atmosphere then acts more strongly to absorb the rays belonging to the blue end of the spectrum than the rays belonging to the red end. The sun's apparent colour, therefore, is less blue than his real colour. If his atmosphere were suddenly removed, he would change from his present white or whitish-yellow colour to bluish, or, perhaps, greenish, precisely as the setting sun, if the air between the eye and him were suddenly removed, would change from his apparently ruddy hue to the white colour of the overhead sun." As the sun constantly varies in colour according to the state of the atmosphere, a difference between his real and apparent colour might have been pre-supposed. It is, however, gratifying to find that photography has played a useful part in determining this point, as it has done in reference to so many other departments of science.

Rejlander's Pictures.—Just now there is a quantity of Rejlander's work to be seen in certain London shop windows. It is unequal in quality, there being obviously some pictures which the artist would not himself have sent out. But the best specimens have stood well the test of time, and impress one with a sense of the genius of the producer as much now as when they were first shown. We say nothing of the "Two Ways of Life," a gigantic task, and one for the proper handling of which photography was unfitted; but of the smaller pictures nothing like them for humour and pathos, and the wonderful suitability of the model to the idea intended to be represented, has been seen. The keen enjoyment expressed by the two faces in "Did She?" ("She Did" has a coarseness about it which renders it of less value); the eager caution of the lad who is catching a fly, and his delight when he has succeeded; the desolation in every line of the ragged boy on the doorstep in the picture known as "Homeless," all proclaim Rejlander to have been an artist of a high order. There is no need, however, to tell photographers this, as they know and appreciate his talents; but the public, how many who gaze at his pictures—there is a little shop in Fleet Street where a crowd regularly gather, and the majority of the pictures exhibited are Rejlander's—know who is the artist? The pictures have no name on them, not that this would make much difference, for the name of O. G. Rejlander is unknown of the multitude. Still one cannot help feeling sad that this extinction should have been reserved for one who in his day did so much to earn the respect of artists for photography. Before it is too late, ought not some good prints in carbon of the best of Rejlander's pictures be obtained for preservation? Accidents happen to negatives, and all these must some time inevitably be destroyed.

By-the-Bye.

ABOUT PHOTO-LITHOGRAPHY.

The whole process of photo-lithography bids fair to be revolutionised by the introduction of the velvet roller, an innovation we owe, as already mentioned in these columns, to the Austrian Geographical Institute in Vienna. Several establishments, both private and government undertakings, have already adopted the new form of roller, and Major Waterhouse, B.S.C., the Deputy-Surveyor-General of India, was so pleased with its working, that he suggested some experiments with rollers made up with other similar materials. Of these experiments, as also of the velvet roller in general, it is our intention to say a few words.

But, first of all, on the subject of photo-lithography generally, we must utter a word of warning. Only those who are competent lithographers can succeed in photo-lithography. And, indeed, this is only to be expected. Lithography is of itself a delicate art, and photo-lithography is more delicate still. A lithographer has already much to learn when he begins, so that he who knows nothing of that art had best leave photo-lithography alone. Only when he has a competent lithographer to assist him should a photographer engage in the art of photo-lithography.

But in these circumstances, he will find that with the assistance of the velvet roller he will rapidly go ahead. The treatment of the sensitized paper we need not here describe in detail, since the reader cannot do better than refer back to Mr. Butter's paper on the subject published in the News of March 19, 1880. Suffice it to say that the paper chosen must be good bank-post, without any ribs—since ribbed paper is not smooth and tough—and that there must be no alum put into the bichromated gelatine bath, upon which this paper is floated. Alum makes the surface hard, and with the velvet roller this may be as delicate as possible without sustaining injury.

We will suppose the bank-post paper floated upon the bichromated-gelatine, and dried. It is put under a line negative—nothing is better for intensifying than the lead formula of Eder and Toth—and printed. The lines of the design can be seen upon the yellow print if you look for them, and they become yet more visible when the impression is put into cold water. It remains immersed for four or five minutes, and is then laid carefully and flat upon a glass plate, which must be a little shorter than the print. Excess of moisture is removed by means of blotting-paper, and the print is now carried off to the lithographic room.

The photographer puts the print down in front of him, upon a press or other convenient position for rolling. A stone slab about the size of the glass plate is convenient for resting the print on. The edge of the print nearest him he tucks under the glass plate; the end away from him is loose, so that when it comes to the rolling, by always rolling away from him, he presses the print down, while it yet has a tendency to flatten out and not cockle. Drawing back the roller under these circumstances would, of course, be fatal.

The velvet roller charged with ink is taken in hand and lightly passed over the print. The rolling is only done one way—away from the printer, as we have explained. The roller is but half the weight of an ordinary litho-roller, and—no pressure or scarcely any—is exerted by the printer. It is hardly like inking a lithographic surface. The moisture over the surface of the impression repels the ink, it is true, but the lines of the drawing or design stand up so prominently that they remind one almost of relief printing. The delicacy of the lines as they gradually take up the black ink reminds one of bank-note engraving, they are so exquisitely sharp and fine, and the lithographer who for the first time undertakes the work is fairly charmed with its beauty. He scarcely knows how he has produced such exquisite work.

There must not be too much ink applied to the print, for the simple reason that this will subsequently be pressed out of shape by the lithographic press, and then the lines get blurred and ragged. A skilful photo-lithographer requires to pass the velvet roller but half-a-dozen times over a gelatine impression—supposing this has been properly exposed—to produce a perfect print or transfer.

The ink used has been transfer ink, so that nothing now remains but to go on with the lithographic work. A polished litho-stone is warmed, the inked-up print is laid face downwards upon it, and then passed through the press. The result is, of course, that the inked impression is transferred to stone, and thence, of course, any number of impressions may be be pulled in the ordinary fashion.

To come back to the velvet roller. It needs very careful construction, if it is to answer well. In the first place, it must be light. Velvet stretched and sewn like leather over an ordinary wooden roller will not answer. There must be either less wood, or the velvet, as Major Waterhouse prefers, may be fitted to a tin stock. In any case, the roller should not be more than half the ordinary weight. Nor must the velvet be sewn in the usual way with a double thickness at the join, but carefully drawn together with stitches. If there is a join, then the roller fails to grip at this part, and the print at this spot not only lacks ink, but is frequently unclean.

Next to lightness, the roller should be of soft consistence, or "puddingy," to use an expressive phrase of a photo-lithographer friend. To ensure this, there should be a flannel under-cover, no less than three rolls of thick flannel, or so-called collar-cloth, being put round the wood or tin stock. The velvet itself soon becomes incorporated in the "puddingy" mass, and especially if it happens to be cotton velvet or velveteen. And here we may mention that the result of experiments with Major Waterhouse's three rollers was to the effect that their value is in the following order, viz:—

1. Cotton Velvet.
2. Silk Velvet.
3. Moleskin.

A "puddingy" nature and "pulling power," when rolling, are the requirements of the velvet roller, and these are best secured by cotton velvet with the underfolds we have specified. The gelatine impression, during the rolling, is treated precisely as a lithographic stone, and may be wetted with sponge or rag, as occasion requires.

Of course it is impossible to *scrape* the ink from a velvet roller. The best way to preserve the roller is to put it into a bag after use, without any further manipulation whatever; then, before beginning work again, free the roller from the old ink by rolling it on a clean slab, cleaning the slab at intervals with turpentine of the old ink. The velvet roller should always be cleaned in this way before using.

There is one more important point, and that is the mixing of the transfer ink for application to the slab and to the roller. So that these instructions may be as practical as possible, we append here the directions of a practical photo-lithographer on the subject:—

Take two ounces of transfer ink from the pot, add ½-ounce of olive oil, mix well together with the muller on a slab; this you will find gives a paste about the consistency of butter. Such paste makes capital stock. When the printer is ready to roll up the transfer, reduce the above with turpentine to about the thickness of cream; you will now find your ink is ready for the roller. Charge the roller liberally, and roll the roller well up on the slab. In so doing, you will find the turpentine evaporate, leaving the ink in beautiful condition for a first-class transfer.

Should you find your ink get too stiff, reduce it with turpentine; be sure you roll your transfer one way only, namely, from you.

If the above directions be carefully carried out, you will be able to wet and roll-up the transfer the same as you would a lithographic stone.

The "At Home" next week will be "Herr Löwy, at Vienna—the Lichtdruck Process in Detail."

A SUGGESTION.

BY ALEXANDER COWAN.

In making experiments in the development of different batches of gelatino-bromide plates, or in testing various samples of commercial manufacture, it is necessary to use ammonia and bromide in many varying proportions, and it would seem advisable to have some ready means at hand to at once take from standard solutions certain proportions which should at once meet the requirements of the case.

In looking over the many formulae that have been proposed, it will be noticed that the proportion of bromide to ammonia varies considerably, the lowest proportion being one drachm, and the highest one ounce to one ounce of ammonia. Taking these two extremes as bases, the following method is suggested.

Two standard solutions are made.

No. 1.—Liquor ammonia	... ...	5 ounces
Ammonium-bromide	... ...	5 ounces
Distilled water to make fifteen ounces.		
No. 2.—Liquor ammonia	... ...	5 ounces
Distilled water ...	... ...	10 ounces

These two solutions can be mixed so as to give any proportion required between the bromide and the ammonia.

Take six small stoppered bottles, and number them 1, 2, 3, 4, 6, 8, and from the two standard solutions mix as follows:—

		Bromine standard solution. No. 1.		Ammonia standard solution. No. 2.
No. 1	...	1 part	and	7 parts
No. 2	...	2 ,,	,,	6 ,,
No. 3	...	3 ,,	,,	5 ,,
No. 4	...	4 ,,	,,	4 ,,
No. 6	...	6 ,,	,,	2 ,,
No. 8	...	8 ,,	,,	0 ,,

No. 1 will contain $\frac{1}{8}$ as much bromide as ammonia
No. 2 ,, $\frac{2}{8}$,,
No. 3 ,, $\frac{3}{8}$,,
No. 4 ,, $\frac{4}{8}$,,
No. 6 ,, $\frac{5}{8}$,,
No. 8 ,, $\frac{8}{8}$ or equal proportions.

At first sight it may not appear that the exact balance is kept up as stated, but if the proportions are analysed it will be seen to be so, because as No. 1 standard contains in each drachm 20 minims of ammonia, and 20 grains of bromide; and No. 2 standard contains in each drachm 20 minims of ammonia, therefore

		Bromide.		Ammonia
1 oz. of No. 1	contains	20 grs.	...	160 minims
1 oz. of No. 2	,,	40 grs.	...	160 ,,
1 oz. of No. 3	,,	60 grs.	...	160 ,,
1 oz. of No. 4	,,	80 grs.	...	160 ,,
1 oz. of No. 6	,,	120 grs.	...	160 ,,
1 oz. of No. 8	,,	160 grs.	...	160 ,,

Thirty minims from either of these bottles mixed with two ounces of pyrogallic solution will give five minims of ammonia to each ounce, or, if it is preferred to use two solutions of equal bulk, then one ounce from either of the bottles mixed with 15 ounces of water, and the pyrogallic solution made double strength, will give the same proportion; but the amount of bromide will vary according to the number on the bottle.

These proportions for the standard solutions have been chosen because, when mixed in any of the varying proportions, the number on the bottle shall exactly represent the amount of bromide in drachms to the ammonia in ounces, and it would seem simpler, when advising any one to use a certain formula with a certain plate, to express that formula by a number instead of by instructions that sometimes involve a good deal of calculation to make just the quantity desired. It may be advised by some as a better plan, to make two standard solutions, one containing only the ammonia, and the other only the bromide; but as this would involve the addition of water in varying proportions, the above is suggested as preferable, as any combination can be made at once without further addition, the ammonia being a constant quantity in each solution.

RETOUCHING BY ARTIFICIAL LIGHT.

BY RUDOLPH.

Ah! retouching by night did you say, sir?

Well, I will admit it's rather a difficult thing to tackle by artificial light; but, as everybody knows, there are possible means of overcoming most difficulties.

That's exactly what I thought when I had thoroughly mastered retouching by the aid of gas-light.

In the first place, you must know that all negatives I have to retouch are dry plates, a boon, I admit, to the operator, but, alas! not so for us poor retouchers (always on the grumble).

I shudder at the mere mention of gelatine; many and oftentimes have I given vent to my feelings (in a more expressive manner than polite) when the point of my pencil has broken off dozens and dozens of times during the retouching of one negative. Those times are things of the past. I used then resin for rubbing up, now I employ a medium (gum thusk and benzole) which I find answers admirably.

Now to retouching. The negatives I retouch I gave you to understand were dry plates, the colour of which, as a rule, are so distasteful to the eye, especially when intensified by the aid of mercury. To do away with that colour when retouching was the main thing I wished to find out.

I set to work. For light I use gas; the burner is an argand, which you will find a great advantage over the other class of burners, as they give a very steady light (an actual necessity); you may use a paraffin lamp, but I always have a horror of the smell of paraffin, and besides, when an individual has to sit at his desk all day, he does not care for being visited by headaches, &c., &c., which I found out was due to the use of paraffin. So much for the means of light.

My desk is of the ordinary make, but, instead of having the various recesses which are employed for different sized negatives, I use a sheet of glass the width and breadth of the desk, and fitted on it is a sheet of stout millboard, with an aperture cut in the centre to admit of a quarter-plate resting inside, which, of course, is prevented falling through by the glass behind. At the back of the desk I place a piece of ground opal (I find the ground opal better than the flashed, as it transmits more light through), taking care that the ground side is from your negative; if not so, you will find the grain a source of trouble to you. At the back of the opal place a piece of blue glass, which alters the colour of the negative entirely. You will find that by using the opal you give a body to the negative, and it also prevents you seeing the gas, which, of course, you cannot possibly help.

The medium I speak of is made thus:—Take (say) two ounces of benzole, and in it dissolve a bit of gum thusk the size of a marble; you apply it to the negative with a piece of cotton-wool, taking care that you wipe the edges off clean.

Notes.

The Sheffield Photographic Society holds an exhibition of pictures and apparatus in January. Our readers will find particulars of the same among our announcements.

The centenary of the birth of the late Sir David Brewster is to be celebrated on the 9th proximo at Edinburgh by a grand banquet, at which Lord Moncrieff will take the chair. Photographers best remember Sir D. Brewster as the inventor of the stereoscope.

Mr. J. R. Capron makes the suggestion that drawings and diagrams to be photographed may be sketched with advantage upon an ordinary slate with ordinary slate pencil. The white pencil markings upon the black slate surface are most effectively reproduced by photography.

Said a young amateur to us the other day: " I like photography awfully; because, don't you know, it is so easy to invent processes." Nevertheless, enthusiasts had best be careful. We heard only the other day of an invalid undertaking a sea voyage, who had made himself dreadfully ill, through nearly inventing something.

During the clever lantern exhibition we witnessed last week, at Manchester, two things struck us very forcibly. The one was the marvellous difference between the slides shown, not only in quality, but as to their pictorial effect; and the other matter for surprise was that no second Albert Smith had come forward to make use of these charming scenes from nature in a popular account of travels.

Until a photograph is projected upon the screen we doubt whether its true value as a lantern picture can be properly estimated. It is very few, so far as our experience goes, that answer all the stringent conditions necessary—to wit, plenty of wholesome light, absence from hard and black shadows, and breadth of composition. A picture of Ilfracombe—we don't know whose it was, or by what process it was printed—did fulfil these conditions to the letter. There was the light of a summer's day, and there was plenty to look at—a steep, hilly road, with quaint cottages beside it, and all the characteristics of a Devonshire village. You could have climbed that road, it was so real, and asked for a sup of milk at one of the cottages.

A few of the other pictures might have been of equal merit, but only very few. The snow and frost scenes, for instance, were exceedingly good, but then a slatey sky is permissible, and deep contrasts are called for. At the same time, for ourselves, we always prefer a bright, sunny snow scene, to one with a leaden sky behind it. If a versatile lecturer selected his slides with care, and exhibited them with due effect, as Mr. Chadwick did on the occasion we refer to, then we believe a most delightful and popular entertainment would be forthcoming; but, we repeat, he must cull of the very best, if he desires his exhibition to take high rank.

Touching the fine interiors of Windsor Castle by Mr. H. N. King, to which we recently referred, that gentleman tells us they cost him no less than 225 journeys to the palace.

The critic of the *Etoile Belge*, a Brussels daily paper, has been cast in damages for libelling the Belgian painter, Van Beers. The critic in question, M. Salzberger, reproached the artist for employing photography as a basis to his painting. Upon this, Van Beers, by way of reply, offered to bet 20,000 francs that this was not the case, the picture in question to be scratched for the purpose of discovering whether or not a photograph lay underneath. The critic declined the bet—few critics, we suspect, have a spare eight hundred pounds at their bankers—and hence the action at law.

" I've got a capital thing for toning, and quite new," and our friend whispered the name of the subtle compound into our ear. Naturally enough, we made an immediate request that he would give our readers the benefit of his knowledge in these columns. " Certainly; oh, yes, I will. Only—only, I have not been able to get it to succeed yet."

The *Archiv* tells this little story. A Paris photographer, who had been doing a capital business, had still the one wish of his heart unfulfilled: he had never received a star or order from the many great men that visit the French metropolis. Two months ago a small Eastern potentate having arrived at the Grand Hotel, the photographer begged an audience, and prevailed upon his Highness to visit the studio. Some charming photographs were taken, and copies of them were, as soon as ready, duly despatched by a smart young clerk to the Grand Hotel. " There will be nothing to pay, remember," was the chief's instructions, for he contemplated calling later on to receive His Highness' congratulations, and anything else the latter might be pleased to bestow.

His Highness received the photographs, approved them highly, and was considerably astonished when he heard there was nothing to pay. Good-naturedly, he called the young fellow before him, and, selecting a gay rosette—no doubt he had his collection pinned in a box, like butterflies—he attached with his own hand an order to the clerk's coat. The despair of the photographer in finding his clerk *decoré* instead of himself may be better imagined than described, as novelists say; and his only hope now is that Cetewayo may be set free, and will visit Paris.

Last Sunday, says the *Daily News*, Meissonier gave in his famous studio in Paris, a *soirée* in honour of an American photographer, who has invented a system by which he can photograph a bird flying, kangaroos leaping, and other four-footed animals in the swiftest motion. His photographs were projected by a magic lantern for the entertainment of Meissonier's guests. One of them represented a Mexican hunt after wild horses; another, a race of buffaloes across a prairie. MM. Dumas fils, Gerome, Cabanel, Berne, Bellecour, Detaille, and Garnier, the architect of the Opera House, were among the literary men and artists who attended the *soirée*. We presume the guest was Mr. Muybridge.

Topics of the Day.

DARK-ROOM NOTES.

BY LYDDELL SAWYER.

At the suggestion of the Editor, I gladly contribute the following notes about the dark-room, feeling sure that on a subject so nearly affecting everyday work even reiteration is pardonable.

Lighting the Dark-Room.—Here is my arrangement of light in the dark-room, and which I find very satisfactory. The window looks out on to a subdued light, and is glazed with one thickness of ruby-coloured glass, 36 inches long by 18 inches wide. Running across the centre of this window there is a shelf just large enough to hold the concentrated solutions of pyrogallol in alcohol, the ammonia and bromide solution, a two-drachm graduated measure for each, and the developing cup.

As the shelf is about five feet from the ground, it is easily conceivable how convenient this method is for mixing the developers by the transmitted light, no groping in the dark for the requisites, no breakage, no mis-measurement.

There is a bench fitted about a foot below the bottom of the window, where I both change the plates and develop them. The whole is contained in an inner closet constructed in the dark-room proper, and I emerge into the outer apartment (where there is much more light) as soon as the developing is completed, to wash and further finish the negative. The lower half of the developing window has an extra thickness of ruby glass, running in a groove, to be used when necessary. The glass above the shelf is covered with white paper, and on the paper is written the formula for both mixing the developers and using them. Of course this, too, is hereby plainly visible by transmitted light, and whoever is required to manipulate has at once both the necessary ingredients and instructions absolutely staring him in the face.

I was glad to notice "Photo-Chemicus" refer in the News to the possibility of admitting more light into the dark-room; it is a subject deserving more consideration. Two years ago I drew attention to the same subject in the Year-Book, when gelatine plate-makers were declaring all veiling, indeed almost all failures, chargeable to the orange-coloured glass. Why, it is most astonishing what amount of light can be admitted! The afternoon sun finds its way through my dark-room window during some of the summer months, and I have frequently developed plates allowing the sunlight to fall on one part of them through two thicknesses of ruby glass, and there has been no amount of extra fog perceptible on the more exposed half of the plate!

Developing.—These are the formulæ which I mentioned as being written on the developing room window:—

Forty-eight-grain Pyrogallol Solution.

Pyrogallic acid	1 ounce
Alcohol	10 ounces

each 10 grains of solution containing near 1 grain of pyrogallic.

Ammonia and Bromide Solution.

Ammonia solution	1 ounce
Ammonium bromide	½ ,,
Water	4 ounces

Normal Developer.—For 8½ by 6½ plate.

Pyrogallic, 6 to 10 grains ... (60 to 100 minims of solution)
Ammonia and bromide solution, 12 to 20 minims... ,, ,, ,,
Water, 3 ounces

For 6¼ by 4¾ plate—

Pyrogallic 3 to 6 grains ... (30 to 60 minims of solution)
Ammonia and bromide solution 6 to 12 minims ... ,, ,, ,,
Water 2 ounces

For 4¼ by 3¼ plate—

Pyrogallic 2 to 3 grains ... (20 to 30 minims of solution)
Ammonia and bromide solution, 4 to 6 minims ... ,, ,, ,,
Water 1 ounce

Yet, I think, it almost impossible to do more than generalize in treating on the developing of gelatine plates; any attempt to fix standard formula must necessarily be vain.

Various emulsions, even from the same maker, sometimes require extreme modifications of developers, a solution being well proportioned for one batch probably yielding far from the best attainable results with the next sample of plates. Hence the necessity of buying largely when we meet with a really good lot.

Then of course alterations of exposure also require a change of developer. As a rule, I endeavour to commence developing with one-third of the normal quantity of the ammonia solution, mixed with the full amount of water, for about thirty seconds; then I add another third of ammonia, and better half of the normal quantity of pyrogallol, for about sixty seconds, after which I complete with the remainder of either, or both ingredients if necessary, for another thirty seconds—total time, two minutes. I like to develop for this length of time; after that, the alkaline solution becomes so saturated with oxygen that the gelatine readily re-absorbs it mechanically, causing yellow dyeing or staining of the film; besides, this is long enough to exhaust most of the details in the plate.

The early addition of ammonia affects the details of the negatives principally; the latter additions of ammonia and pyrogallic act predominantly on the intensity of the higher lights; therefore is it advisable to liberally apply the ammonia, and to withhold the pyrogallol at the earliest stages of finding that a negative is under-exposed.

It is well to test what capacity of absorption of ammonia the batch of plates in hand has without producing fog. Different lots vary exceedingly, owing to both chemical and mechanical causes. I have very advantageously used up to thirty minims, with a proportionate increase of pyrogallol for an 8½ by 6½ plate.

It is vague and somewhat erroneous to conclude that ammonia gives alone the softness, and pyrogallic the strength, to a negative; that is, I mean if we accept the normal condition of fairly-proportioned developer, and correct exposure. The principal action of the ammonia is to render the pyrogallol alkaline, in which state alone it (the pyrogallol) has the power of developing the gelatine film of bromide of silver; therefore, if the two ingredients are exhausted together, the re-addition of one of them without the accompaniment of the other is to a great extent futile. Particularly is this the case when the pyrogallol alone is added. Thus it is that we have so little control with respect to over-exposed negatives; the same power which really permits the accession of the necessary intensity acts also in developing the details.

Increasing the bromide in the developing solution assists considerably in controlling over-exposed negatives.

It is surprising to find to what an extent density is acquired in negatives slightly failing in the matter of exposure. I think it proves conclusively that in addition to the de-oxidizing action of the developer, there is a power in the film of re-absorbing the liberated oxygen, proportionate to its (the film's) approach to metallic silver.

Decidedly under-exposed negatives do not become dense, simply because the molecular derangement commenced by the light is insufficient to be grasped by known developers.

I find no detrimental effects from keeping the pyrogallic acid in alcoholic solution; I can perceive no difference of results when using the dregs of one ounce or the first of a fresh ounce so mixed, nor do I notice any disadvantage by using glycerine as advocated.

Clearing the Negative.—Immerse the negative as quickly as possible in the fixing solution after the development is completed; the film discolours very freely while in this transient state. I find the addition of alum to the hyposulphite bath very advantageous, the simultaneous action of the two salts appearing to more rapidly remove the frequently occurring yellow surface stain. I left a negative in this double bath one night, that was spoiled by the formation of blisters a little less in size than peas, and the next morning they had disappeared; how, or why, I know not. It is my experience that, if the film is impervious enough from blistering, hydrochloric acid will perform in a few seconds all that alum does in as many days, as regards freeing the negative from discolouration.

Regulating the Density of the Negative.—A good way to reduce the density of the actual silver, and probable altered form of oxide, constituting the legitimate deposit of a negative, is to merely rinse with water after removal from the soda bath, and then to leave it exposed to the air; the action of the hyposulphite of soda—in a weakened form, presumably necessary to admit of outer influences—and the ordinary atmosphere combined, apparently effecting some chemical decomposition. We have an analogy to this in a hull of a boat "twix't wind and water," notably its weakest part; or again we have it pourtrayed in photographers' ebonite bath dippers. The same treatment, by the way, hastens the elemination of free bromide of silver when this negative is extra slow in clearing.*

Avoid after-intensification when at all possible—and it generally can be rendered unnecessary by the judicious re-application of pyrogallol and ammonia near the finish of developing—but when further strengthening is imperative, I still prefer trusting to the fickle friendship of mercury; it really does give a fullness of body to an image. I like to strengthen first with bichloride of mercury in solution, then to finish with dilute ammonia (about 15 per cent.). To my mind the bichloride is more thoroughly reduced by this manner of procedure than when it is used suspended with iodide of potassium.

The destructive effect in mercury-intensified plates appears to be greatly increased by the superfluous divided particles which frequently attach themselves to the plate along with the real deposit.

Particularly is it necessary to remove the last trace of hyposulphite of soda before submitting the negative to mercurial treatment. I am not acquainted with the positive decomposition attending the combination of hyposulphite of soda and bichloride of mercury, but it is evident that when the hyposulphite salt, in minute quantity, is present in solution with the latter, it produces a by-product of sulphide of mercury or some such substance having affinity with the composition of the plate, and with which it deposits as a divided yellow stain.

Frilling.—Until lately I have entertained the opinion that a plate intent on frilling was incurable; certainly alum is inadequate to always prevent it—indeed, I have considered it in some cases productive of the evil by contracting the film. I have now, however, found a sure remedy in the following method, when the negative is worth the small trouble incurred.

It is in the fixing bath that the frilling evil generally takes matters into its own hands. If I have cause to suspect a plate, after developing and washing, I absorb the moisture with alcohol, and then complete the drying. With the careful use of the fire or stove this occupies about five minutes, and when it is accomplished I immerse in the fixing bath with confidence.

Good Plates.—If you purchase your plates ready prepared—and I think it is best to do this—remember that these from every recognised maker are good—sometimes. Fortunate is the man who can and does obtain samples of various emulsions until he finds a batch which exactly suits him. Then let him grasp at every box that he can get—the more the better.

After all is said about art, so much does the everyday success of a practical photographer depend on technical quality, that verily a "duffer" with reliable plates is superior to a duly qualified man who is harrassed by the vagaries and uncertainties occasioned through the use of frequently varied emulsions.

Correspondence.

SPECIMENS.

Sir,—Some few weeks since I read an article "Wanted, an Operator," by Cliff. I could not but be struck with the knowledge he displayed of his subject, and at the same time admire the moderation of his language. I have had plenty of practical illustrations of the treatment which some employers bestow upon the workmen; but within these last few weeks I have got, I may say, the cruellest cut of all. I had advertised for a situation, and by the first post after the issue of the paper I received an application from a party in Birmingham, requesting me to send terms, carte of self, &c., with a promise to return said carte *at once* (these words underlined). Accordingly, I forwarded a chromotype cabinet, with a request that care should be taken of it, as I had but one other to spare. A week passed and I heard nothing; I then wrote to him politely, intimating that I would be glad of its return, and an answer about the situation. Three days now passed, and still no reply. I next sent a post card, wording it in such a style that I felt sure it would have the desired effect; no use—still a mysterious silence.

I now got curious to see what kind of person did business in this manner; so, as there was nothing to hinder me, I ran through from Manchester to see him. I found he had a pretty good place, and doing a good business. After waiting some time, I found the principal, and at once introduced myself, stating my business. He looked at me earnestly, tapped his forehead thoughtfully, asked how long it was since, where it was sent from, and did I never receive it, and a number of other irritating questions. Still I felt more surprised than angry at him at first; then, after asking a careless question of the young lady, I suppose, who sees to the packing-off department, he turned coolly, and said he was afraid it had gone a-missing, but "since I was there, he would take another of me." I declined; although one might think it a fair offer, yet, in my estimation, a silver print would not equal a beautiful and spotless chromotype.

One sentence more, and I have finished. Do you think it possible for a business man to reply personally to an advertisement, and in a two weeks' time, during which he received a photograph, two notes, and a post-card, to forget all about it? If so, the Birmingham man has the shortest memory on record.—Yours ever, Beau Nash.

PACKING PICTURES FOR EXHIBITION.

Sir,—Having had something to do with the opening, &c., of cases of photographs during the last fourteen days, I cannot help thinking that a few suggestions as to the packing of framed pictures would not be out of place, particularly as there are exhibitions to be held during the coming year. Now if each exhibitor would state on the back of each picture the name of the subject and number of his exhibits, adding his own name and address, there could be no excuse for hanging committees and cataloguers. As regards packing small frames up to say two feet, I think there is no better plan than packing in a box with strips of wood nailed down the sides, forming grooves as in a plate-box, each frame to be wrapped separately in paper, and packed tightly in the grooves with waste paper, &c.; or, better still, each frame folded in felt carpeting, or put into a bag made of the same material, and then placed in the grooves; the frames would then be practically each in a separate box, and could not possibly get scratched or rubbed during transit by rail. With larger pictures there probably is no better method than to screw one frame to the lid, and another to the bottom of the packing case (the screw heads to be on the outside of the case), so that when the lid is fastened down the pictures face each other.

---

* Since I wrote the above, I have read Dr. Eder's opinion—expressed in his exhaustive little book on Modern Dry Plates—that it is the weakening of the hyposulphite salt alone which makes the bromide more readily soluble; but, though open to conviction, I still incline to my own opinion that the atmosphere enacts a part. For example, by laving a negative while in the fixing, and thus submitting it alternately to the action of the air and the hyposulphite, it more readily fixes than when under the influence of the solution alone.

If exhibitors persist in packing frames measuring about 4 feet by 18 inches, simply tied between ¼ or ⅜ inch boards, there is sure to be breakage, or other damage done; as such a package simply raised from the ground by a man taking hold of one end only is not sufficiently rigid to prevent the boards bending, and the consequent breaking of the glass.

The writer hopes that if the Editors are agreeable, other correspondents will offer further suggestions on this most important subject to both exhibitors and the promoters of exhibitons.—Yours, &c., J. W. Leigh.

Dear Sir,—Seeing the suggestion by "F. M. S.," and your remarks concerning artificial light for retouching, I venture to state my plan, which is cheap and simple. First, I bought a Doty burner from Prince and Symmons for three shillings and sixpence, and one of their six-inch silvered concave reflectors. The burner was arranged on a 2-lb. meat tin with reflector at the back, so as to light up a screen of waxed paper; the light is sufficient for a dense collodion negative, and can of course be turned down to suit a transparent gelatine one. The Doty burner with one of Solomon's condensers is also very useful for enlarging, as it gives a fine steady ball of flame about the size of a walnut.

The question of light for the developing room is still alive, I see. For my part, I find no necessity for ruby light, perhaps because there is no window in my room, and so my light comes from a half-inch paraffin lamp. The piece of yellow paper sent is the same as that I use, but mine is oiled to make it more transparent; it allows free passage of green and red, and no doubt a transparency might be made by the light in a few minutes; but then there is no need to expose the plates but a few seconds. Before flooding them with developer (pyrogallic), sometimes I have tried a pane of ruby glass as well, but find no difference. The plates used are rapid commercial ones (Nelson's, P.A.C.S.A., Autotype, Archer's, Bennett's, &c.). For my outdoor trap, a good coat of burnt sienna, which also transmits green, has proved sufficient, but of course I don't let sunshine fall on the window.—Yours truly, E. Williams.

TOPICS OF THE DAY.

Sir,—In answer to your invitation to photographers to suggest "Topics," might I suggest that there be one on "The Construction of the Glass Room?" I think it would meet a great want, as so many who are about to build a studio have to use their own ideas, which, judging by results, are often very crude. W. Shawcross.

LIGHT IN THE DARK-ROOM.

Dear Sir,—May I venture, with all good feeling, to make a few remarks in reply to your paper on the above subject appearing in the News of the 18th inst.?

In the first place, I develop bromide of silver plates daily in light filtered through one thickness of ruby-coloured glass, about 18 inches square. I have used this window in all shades of light, with emulsions of every ordinary variety of rapidity, without experiencing any effects of fog on those parts of the plate which are undeniably protected from light in the camera by the slide corners or similar obstructions, and these, I think, are the only parts of a negative that can be judged with impunity.

It is very interesting to know what effect (say) five minutes' exposure to the light I mention would have on a bromide of silver plate; but of what practical import is it (beyond teaching caution), when we only require the plate to be under its influence for about thirty seconds before the appearance of the image dissipates all danger?

I say thirty seconds, but five to ten seconds are nearer the time really necessary for the full use of the light—that is, while the plate is having the developing solution flowed over it, the previous and subsequent proceeding being easily conducted in a light reduced quite four-fold by simply avoiding its direct rays.

Possibly this may come under the category of "dodging;" but this is the question at issue—is this mode of procedure more troublesome or less commendable than working in "visible darkness?"

Of course, the light necessary for the preparation of emulsions is a perfectly different question. Nor would I recommend developing by orange-coloured light. What I contend for is the possibility and advisability of using sufficient ruby light to work comfortably—more would be superfluous.

With regard to the experiment where an unexposed plate showed fog, while one previously exposed appeared clear, I am not just now in a position to positively assert my conviction; but, from observation, I suspect that where an atomic derangement is effected to a certain extent by light, these parts have some at present unknown influence on other portions which the light has altered to a certain different degree.

I do not wish to dispute your views, my dear sir—indeed, in the abstract, I quite agree with them; I only desire to protect the assertions expressed on the subject in my paper on "Dark-Room Notes," kindly inserted by you this week in the News.—Yours very truly, Lyddell Sawyer.

NEGATIVES ON PAPER.

Sir,—On reading my copy of the Photographic News of the 25th inst., I see you notice at page 558, some negatives on Morgan's paper that have been exhibited at Toulouse, by a gentleman of the name of Aneely.

Permit me to observe, that having been an amateur for over twenty-five years, I have for a long time past been prosecuting experiments for obtaining negatives in the camera on this and similar paper, and have succeeded in obtaining them in every way equal to those which can be obtained on glass, and with no longer exposure. So satisfied was I with the results, that on the 11th day of June last I provisionally patented my process as a novel application, but, on reflection, I decided not to proceed with it, leaving it for the general good of photographers.

Negatives so taken at once remove all the embarrassments at present caused to travellers and tourists by the weight, fragility, and cost involved in the use of glass, and I have long been satisfied (and have so expressed myself to several of my photographic friends) that negatives thus taken on paper will eventually supersede glass plates.

Some two or three months ago, some of my specimens were exhibited to the Manchester Photographic Society, and were well spoken of. The idea that, because paper is used, the negative will not print as well and clearly as if on glass, is a pure error, which on trial is at once dispelled. The reason is this: these pictures are formed in the gelatine surface, which is supported on paper; as, in the ordinary plate, it is on glass, and is not, as was the case with the old calotypes, in the substance of the paper. Now when this negative, so supported on paper, is placed in contact with the silver paper in the frame, and exposed to the light for printing, the only difference that results is, the light, having to pass through the supporting paper, it takes a little longer than when plain glass is used as the support; but the resulting print is quite equal. I was led to try this from observing how often professional photographers put tissue paper, or matt-varnish, or in some other way screened the back of the negative, so as to retard the too rapid passage of light, and so retard the printing, and I noticed the effect it produced. I tried Morgan's paper, and paper prepared by myself, and became satisfied we need no longer be encumbered with glass, or run the risks it involves. Observe the field thus opened, and the comfort for travellers! I have invented a slide for use with paper negatives; in it I place a number of pieces of paper (say twenty-four), and expose them one after another on different subjects, obtaining, without further trouble than the focussing, so many negatives; one slide thus containing all that is needed for a day's work. I shall be glad to communicate information respecting it, should any of your readers think it worth their while to enquire.—I am, sir, yours truly, J. B. Holroyde.

PHOTOGRAPHY AND THE PUBLIC.

Sir,—I see in your journal of Nov. 11th a long reference to a letter of mine on "Photography and the Public," in *Public Opinion* of October 22nd. The writer of "Photography In and Out of the Studio" devotes a long paragraph to a notice of my letter to *Public Opinion*. In justice to myself, however, I would refer your readers to *Public Opinion* of Oct. 22.

The writer of your article makes some quotations from my letter on which he puts his own interpretation, and he tries to make out that I state the makers of commercial dry plates send out systematically worthless plates that cannot be relied on.

I entirely deny this; I stated, and repeat it, that worthless plates are at times sent out, either mixed with good ones, or in a bad batch by themselves, and by makers with the best reputation. But this may be done by carelessness, or trusting to subordinates who prepare the emulsions for the plates.

The late Editor of the Photographic News, Mr. Wharton Simpson, wrote an article on this very subject in (I think) the Photographic News, of 1876 or 1877 (those of your readers who have back volumes can refer to it). He referred to a letter of mine in the News on this subject, and he stated that commercial dry plates were often prepared with great carelessness, and that ignorant persons, and even children, were often employed in their preparation.

The writer of your article November 11th further remarks that "the plates of one maker fail in one man's hands, when they succeed perfectly well in the hands of another."

This is of course true, if one is a "tyro" and the other an oparator accustomed to the working of collodion, gelatine, and other dry plate processes. But the best of operators in the world, with the best of chemicals, cannot get out of a plate prepared with a thin or a spotty emulsion anything but a ghost of a negative, or one covered with spots.

The question really is, why are plates sent out from the same maker, some of which produce excellent negatives, while others, worked by the same operator and with the same chemicals, produce only ghostly images, or negatives covered with spots, moons, comets, or stars?

Having worked commercial dry plates for more than ten years by hundreds, and indeed by thousands, it is not to be supposed that the writer of your article infers that Captain Turton does not know a good dry plate from a bad one, or is unable to tell under- from over-exposure.

He ends this long notice of me by saying:—"We are inclined to think, for obvious reasons, that Captain Turton will have some difficulty in establishing his position."

The only "obvious reason" that Captain Turton thinks might have any effect to prevent him in establishing his position is the possibility that the statements contained in his letters contain far too much truth to be pleasant to the makers of commercial dry plates, and that in consequence they might be suppressed by the editors or proprietors of the photographic journals.

But the photographic journals are the organs of the whole of the public interested in photography throughout the civilized world, and are hardly likely to render themselves the tools of a clique of traders interested chiefly in the sale of commercial dry plates. Francis W. Turton.

Proceedings of Societies.

Liverpool Amateur Photographic Association.

The annual meeting of the above Association was held on Thursday evening, the 24th ult., at the Free Library, the President, Mr. W. H. Kirkby, in the chair.

The minutes of the October meeting were read and confirmed, and Messrs. A. Holt and W. Macindoe were elected members of the Association.

The Hon. Secretary read the following

Annual Report.

The President and Council have every reason to congratulate the members of the Liverpool Amateur Photographic Association, at the opening meeting of the nineteenth year of its existence, upon the usefulness and success of the work of the Association during the past year.

There has been the usual progress in the numerical strength of the Society, ten new members having joined our ranks; while there has been, on the other hand, only one resignation,—and one removal from our midst by the hand of death. The number of the members on the books of the Society for the last five years stand thus:—1877, 57; 1878, 59; 1879, 67; 1880, 71; 1881, 79.

The Council regret that the name of Mr. A. Cooke can no longer be included on our list. The death of Mr. Cooke (in October last) has deprived the Association of one of its oldest and most respected members.

An effort has been made to render the meetings of the past year distinctly practical in their character, and the result has been met with the most gratifying success. At each of the monthly gatherings of the Association, a demonstration of the practical working of the more recent and interesting of the photographic processes has taken place. The result has been to increase to a very marked extent the numbers of members attending, and, the Council feel they may add, the usefulness and success of the Society.

The following have been the papers and demonstrations of the past year:—

A demonstration of the process of micro-photography, by Mr. Bruce; a paper on "Photographers Afield," by Mr. Corkhill; a paper on "A Photographic Trip to Chepstow," and a demonstration of the mode of development of Stebbing's films, by Mr. Ellerbeck; a paper on "Copying Engravings by Lamplight," by Mr. Houlgrave; a paper "On Daylight Emulsification," and a demonstration of the platinotype process, by Dr. Kenyon; a demonstration of his modes of making gelatino-bromide emulsion and plates, by Mr. Kirkby; papers "On Gelatino-Bromide Enlargements," "On Paper Negatives," "On Frilling," and "On Landscape Enlargements with Home-Made Apparatus," and a demonstration of the method of the development of Morgan's paper, by the Rev. H. J. Palmer, M.A.; a paper "On the Portable Stereoscope," by Mr. W. H. Warner.

The out-door meetings of the Association have been very enjoyable, though hardly as well attended by members as is perhaps desirable. Excursions have been made to White Ladies' and Lilieshall Abbeys, Boscobel House, Tong Church, the Falls of the Twrch and of Port Llewydd, Dolgelley, Ruabon, and Wynnstay Park.

The Association took a prominent part in the associated *soirée* of last year, and some four hundred and fifty prints, together with apparatus of different kinds, were exhibited.

Among the exhibits at our meetings of the past year of special interest may be mentioned the competitive prints of the South London Photographic Society, kindly lent to us by the President, the Rev. F. F. Statham, M.A., and the collection of cameras, instantaneous exposers, stand, &c., &c., contributed by various members and others to the Exhibition given at the September meeting. One result of the loan from the South London Photographic Society has been the inauguration of an annual competition among ourselves, and the exhibition to-day of the competitive pictures evinces unmistakably the success of this innovation. Rules for the regulation of these competitions have been debated and decided upon by the Association at the April meeting.

The Council have decided that the presentation print for the present year shall consist of an enlargement of a suitable negative—if possible—contributed by a member of the Society.

The thanks of the Association are due to the Library Museum and Arts Committee of the Corporation of Liverpool for their kindness in granting the use of the room in the Free Library, in which these meetings are held; to the Photographic Society of Great Britain for copies of the *Journal*; to the Liverpool Engineering Society for a copy of its Transactions from the year 1877 to 1880; and to Mr. J. T. Taylor, editor of the *Photographic Times*, for copies of that paper.

The Treasurer then read his report, which showed a balance of £42 in favour of the Association. These reports having been duly passed, the under-mentioned officers were elected for the year 1882:—

President—E. Roberts.

Vice-Presidents—B. Boothroyd and J. W. H. Watling.

Hon. Treasurer—E. Twigge.

Hon. Secretary—Rev. H. J. Palmer, M.A.

Council—J. H. T. Ellorbeck, T. W. Bruce, A. Tyrer, W. E. Potter, B. J. Sayce, H. A. Wharmby, J. H. Day, G. A. Kenyon, M.D., E. Phipps, W. H. Wilson, W. H. Kirkby, and K. Bean.

The Hon. Secretary brought before the notice of the meeting a letter which he had received from Captain Turton on the subject of commercial plates. The members decided that the matter, although of great importance, was one with which the Association could hardly deal.

The Hon. Secretary introduced the subject of the exhibition by the Association at the coming *soirée* of the Associated Scientific Societies, at St. George's Hall, on December 21st. It was arranged that there should be an exhibition of apparatus and pictures, and a committee, consisting of the Revs. T. B. Banner and H. J. Palmer, and Messrs. Bean, Corkhill, and Maycock were appointed to make the necessary arrangements. Members and others having pictures or apparatus to exhibit were requested to send the same to Mr. Ellerbeck, 54, Bold Street, on or before Tuesday, December 20th.

A discussion then ensued on the subject of a December meeting, and it was decided to give a lantern exhibition in the lecture theatre of the Free Library, to which members were invited to bring their friends. The date would depend upon the arrangements and consent of the Library Committee. This has subsequently been arranged to take place on Thursday, December 22nd.

The first of the annual competitions then took place. Forty pictures were exhibited, and the following were the results of the voting:—

Subject.	Number of competing pictures.	Prize winner.
Still Life	3 ...	... J. H. Day.
Foliage	4 ...	... J. H. T. Ellerbeck.
Tired	9 ...	... W. H. Kirkby
Seascape	6 ...	... J. H. T. Ellerbeck.
Interior	7 ...	... J. H. Day.
Clouds	3 ...	... J. H. T. Ellerbeck.
Own emulsion	3 ...	... Rev. H. J. Palmer.
Spring	5 ...	... J. H. Corkhill.
Best series of pictures ...	— ...	... J. H. T. Ellerbeck.
Best picture of the whole forty	— ...	... J. H. Day.

The prizes were awarded by the votes of the members present. In several cases an equal number of votes was received by two competitors, and this necessitated a fresh vote.

A certificate of honour was awarded to the producer of the best picture in each of the subjects announced early in the year, and prizes were given—1. For the best picture produced with emulsion made by the competitor. 2. To the exhibitor of the best series of pictures. 3. To the producer of the best photograph of the whole of the exhibits.

It having been announced by the Chairman that, in consequence of the length of the proceedings connected with the competition, the arrangements for next year's competition and Dr. Kenyon's demonstration must be postponed until the next general meeting,

Mr. King proposed, and Mr. Ellerbeck seconded, that "Winter" be included among the competitive subjects for next year. This was carried unanimously.

Mr J. H. T. Ellerbeck suggested that, since the funds of the Association were in a flourishing condition, certain apparatus necessary for demonstrations at the meetings should be purchased. The suggestion was deemed an excellent one, and, having been formally proposed and seconded, was carried *nem. con.*

Mr. K. Bean exhibited a negative and print of a scene photographed by moonlight, on a Mawdsley plate, with an exposure of forty-five minutes.

Mr. Atkins showed a new instantaneous shutter of great ingenuity and effectiveness; Mr. Day exhibited a new camera by Newton; and Mr. Ellerbeck a large number of mounted pictures of the highest excellence.

The meeting was then adjourned till December 22nd.

Thursday Evenings for Photographers.

At the meeting held on the 24th inst., Mr. T. J. Pearsall in the chair,

Mr. Henderson demonstrated his method of making chloride of gold. He said he preferred to use chemically pure gold, which costs him £4 5s. 6d. per ounce, rather than commercial gold, which can be procured at £3 17s. 6d. per ounce. He places an ounce of gold in a flask with five ounces of aqua-regia (hydrochloric acid two parts, nitric acid one part), and, instead of using a Bunsen burner, he said he prefers to place the flask outside a window at night, and by the morning the gold is all dissolved. He prefers not to crystallize, but keeps it in a liquid state, neutralizing as he wants it for use. He said that not only does he find it less expensive to prepare the chloride of gold himself, but that he ge's better results than with the commercial preparation.

A discussion on gold, its alloys, and impurities and their effects in photography, then took place.

Mr. A. J. Brown showed some prints on prepared silk, one of which had been immersed in a thirty-grain solution of carbonate of soda, causing the silk to turn a foxy colour; the others were immersed in a diluted bath, and had not changed colour.

The Chairman suggested that perhaps the change in colour was due to something in the dressing of the silk, and suggested that Mr. Brown should communicate with the firm who supplied the sensitized silk, and report at a later meeting.

Mr. Henderson suggested that to test the purity of the silk, it should be immersed in nitric acid, and then in chalk and water; when, if the silk was pure, it would strike a beautiful orange colour.

Mr. Brown said he had washed the prints in soap and water, and could detect no change in them. It having been stated at a previous meeting that the ozone bleach acted upon platinotype prints, he (Mr. Brown) produced some prints which had been treated some before and some after exposuse with the bleach, with a view of decolourising a yellowness in the paper supposed to be induced by damp; the prints exhibited showed a decided bleaching action in the shadows.

Mr. Cowan said he had made the following standard solutions of ammonia and bromide with a view of readily obtaining different strength solutions of either:—

No. 1.—	Liquor ammonia	5 ounces
	Ammonium bromide	5 ,,
	Distilled water	5 ,,
No. 2.—	Liquor ammonia	5 ounces
	Distilled water	10 ,,

He then made the following six solutions of ammonia and bromide for use; the numbers representing the amount of bromide in drachms to ammonia in ounces.

No. 1 = 1 part of No. 1 to 7 parts of No. 2.
2 = 2 ,, ,, 6 ,,
3 = 3 ,, ,, 5 ,,
4 = 4 ,, ,, 4 ,,
6 = 6 ,, ,, 2 ,,
8 = 8 ,, ,, 0 ,,

For use, 30 minims of either to each 2 ounces of pyrogallic solution, or 1 ounce of either to 15 ounces of water, and use with equal bulk of double strength pyrogallic. No. 1 contains, in each drachm, 20 minims ammonia and 20 minims of bromide. No. 2 contains in each drachm 20 minims ammonia.

			Bromide.	Ammonia.
1 ounce	No. 1	contains	20 drachms	160 minims
	2	,,	40 ,,	160 ,,
	3	,,	60 ,,	160 ,,
	4	,,	80 ,,	160 ,,
	6	,,	120 ,,	160 ,,
	8	,,	160 ,,	160 ,,

The constant quantity of ammonia to each ounce of pyrogallic is 5 minims. He then made six transparencies, exposing all to a gas-flame three feet off for twenty seconds, and developed as under:—

	B and A solution.	Time of Delvelopment.
No. 1 ...	1	1½ minutes
No. 2 ...	2	2 ,,
No. 3 ...	3	3 ,,
No. 4 ...	4	3½ ,,
No. 6 ...	6	4½ ,,
No. 8 ...	8	6 ,,

the results showing that quite as good, and in some respects better, results may be obtained by using a large quantity of bromide and prolonged development, as with a small quantity of bromide and quick development. He then made five other transparencies, giving the same exposure as before, and developed with bromide and ammonia solution No. 8, as under:—

No. 9	developed with	No. 8 solution diluted	4 times,	24 minutes
„ 10	„	„	„ 8 „	48 „
„ 11	„	„	„ 16 „	96 „
„ 12	„	„	„ 32 „	3 hours and a half
„ 13	„	„	„ 64 „	left all night, or, 16¼ hours

He then made two negatives, and developed the first with bromide and ammonia solution No. 4, and, finding it took sixty seconds to develop, he developed the other with the same number solution diluted eight times, and allowed it to remain untouched for sixteen minutes, results in this case being almost identical. He found it necessary to use distilled water, as the ammonia caused a deposit with common water.

Talk in the Studio.

Society of Arts.—On the occasion of an exposition of the Popp Resch system of pneumatic clocks, which was given by Mr. J. A. Berly, on Wednesday last, the hall of the Society was well illuminated by the electric light (Jablochkoff system), no less than eight lamps being in action. In order to test the practicability of obtaining satisfactory photographs by this light, Mr. H. T. Wood arranged for about a dozen cameras to be placed in different positions, and for a series of exposures to be made previously to and during the meeting. Among the most successful results may be mentioned some plates developed by Mr. Wood himself, and by Mr. W. K. Burton; but it was found that an exposure of at least fifteen to twenty minutes was required to obtain a satisfactory general view of the room, with an aperture of $\frac{f}{9}$. Mr. Wood stated that he had made arrangements for the electric light to be in action on the occasion of the ensuing meeting of the South London Photographic Society.

Maynard's Emulsion Washer.—This apparatus is simply a large syringe made of glass, a plated wire disc being turned over a flange, which strengthens the open end. Glass certainly possesses a notable advantage over ebonite, inasmuch as it is easy to ascertain with certainty whether this instrument is in a satisfactory condition of cleanliness. The sizes ranges from two ounces to ten ounces.

Action by the Stereoscopic Company (Nottage v. Findley).—On Tuesday last, before Mr. Justice Field and Mr. Justice Cave, the further arguments in this motion were resumed. The motion was commenced on the 24th instant. Mr. Russell's opening arguments at the previous hearing had raised an interesting point as to "jurisdiction," under the Judicature Act and Copyright Act of 1862. This point, however, as well as others, was not decided, the matter being settled during Mr. Russell's argument. The facts were briefly these:—Mr. Alderman Nottage, the plaintiff, was a member of the firm known as the London Stereoscopic Company, and the defendant was a trader of Glasgow. It appeared that Mr. Nottage's firm were the authors of certain photographs of the present Ministry, which were registered by them under the Arts Act, 1862. The plaintiff alleged that the defendant had infringed their copyright in these pictures in that he had caused to be grouped and printed upon handkerchiefs copies of these photographs, and that he had sold large quantities of them as the "Cabinet Handkerchiefs." The plaintiff had brought this action under the Copyright Act to recover penalties and damages from Mr. Findley for this alleged piracy. An order had been obtained giving Mr. Nottage leave to serve the defendant with the writ in the action out of the jurisdiction—viz., in Scotland. The defendant then obtained leave to enter a conditional appearance. The motion now in argument was an application on his part to set aside that order, the service, and the conditional appearance. Mr. C. Russell, Q.C. (with him Mr. Mansel Jones), were for the defendant; and Mr. Pollard (with him Mr. H. Purvis) appeared for the plaintiff. Mr. Russell, Q.C., in the course of his arguments, read to the Court an affidavit by Mr. Nottage setting out his matters of grievance, and the facts in connection therewith, and was proceeding to deal with them when Mr. Justice Field, having conferred for a moment with Mr. Justice Cave, said, addressing the counsel on both sides:—We think that as a matter of fact the piracy complained of is trifling, and in the absence of any feeling of vindictiveness on either side, the whole action might be settled at once. Upon this suggestion from the Bench, the learned counsel engaged at once agreed to settle the whole matter as follows—the defendant to pay £152 10s. in full settlement of the plaintiff's claims, and to hand over the blocks used in printing the "Cabinet Handkerchiefs," and any such handkerchiefs under his control; all proceedings in the action to be stayed. Mr. Justice Field said he wished it to be understood that the Court, by advising this settlement, did not do so because they thought the action should not have been brought. On the contrary, he said that the action was a most proper one, as the plaintiff must protect his right.

To Correspondents.

F. N. J.—1. Your difficulties may arise from a partial fogging of the plates either during their preparation or their after treatment. 2. You might try a developer of the same proportions as that you refer to, but four or five times as strong.

G. Gavin.—A prolonged soaking in a saturated solution of alum is effectual in many cases. The solution may advantageously be rendered decidedly acid by means of citric acid; or a few drops of hydrochloric acid may be added to each ounce.

T. K. Biddell.—Place your lamp in such a position with regard to the condenser that the image of the flame corresponds as nearly as possible with the diaphragms of the objective.

Angle and Co.—1. We know nothing of your previous letter. 2. Considering that the information you require can be gathered from the current Year-Book, or from almost any hand-book of photography, it is undesirable to exclude more important matter by inserting it here. 3. Certainly not.

C. E. G. W.—1. The only hope rests in soaking them in a dilute solution of potassium cyanide. 2. See answer to "W. H. M." in our issue for October 28, 1881.

Joseph Jaques.—If, before setting out, you explain to the American Consul that you intend to take up your residence in the United States, it is probable that he will make some arrangement by which you will be enabled to take what is absolutely essential for your purpose.

Frank M. Sutcliffe.—Much depends on the quality of the gelatine, and if you employ a soluble kind, such as Cox's soup gelatine, you will experience no difficulty. A small proportion of acetic acid may, however, be required. 2. The last we bought were charged considerably under the price you mention, but we cannot depart from our rule not to recommend makers individually.

C. F. S.—The difficulty may be met by adding a little whiting to the bath when it ceases to tone satisfactorily, filtering the liquid, and then adding half as much acetate of soda as was originally employed.

W. E. D. Jones.—1. Both show a decided improvement, but the lighting might have been a little more horizontal with advantage. 2. Soak in water to which one per cent. of glacial acetic acid has been added. 3. The case is probably hopeless. 4. The best way is to buy one ready made, as the process of grinding and polishing is troublesome. Liquid condensers are generally unsatisfactory. 5. For stopping holes, nothing is better than Prussian blue as sold in cakes for water-colour painting. It will not be removed on applying the varnish.

H. James.—The variation is not so great as in some cases with which we have met, and if your emulsion contains a full proportion of bromide of silver, it is extremely probable that twenty dozen might be coated with one batch. Any thickness beyond that which is necessary is undesirable.

R. O.—1. By far the best method is to intensify them by the lead process of Eder and Toth. 2. The general principle of the incandescent lamp is open, and each of the gentlemen to whom you refer has patented certain improvements or modifications. 3. Fairly satisfactory results can be obtained by exposing through the glass; but it is much better to use a mirror or prism.

Progress.—1. For such small work as you propose to do, an ordinary printing-press with vertical pressure will suffice. A foolscap folio Albion or Columbian press will give you a safe margin of power.

Ignoramus.—We might be able to judge more certainly if we saw the negative; but we consider it highly probable that the phenomenon arises from the cause you mention.

F. C.—You may be able to obtain a situation in a photographic establishment, but it would probably be in a very subordinate capacity. In such case your future progress would depend principally on the extent to which you might prove yourself valuable.

A Country Photographer.—We think that treatment with a solution of ammonium sulphide might prove a remedy, but if the negative has been varnished, all traces of resinous matter must first be removed. Try an experiment on one corner of the negative before proceeding further.

Several Correspondents in our next.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1214.—*December* 9, 1881.

CONTENTS.

PAGE
Mounting Prints ... 577
Some Photographic Uses of Celluloid ... 577
On Halation and on the Development of Silver Iodide. By Captain W. de W. Abney, R.E., F.R.S. ... 578
French Correspondence. By Leon Vidal ... 579
Half-an-Hour on Photographic Matters. By W. D. Valentine ... 580
Notes ... 582
PAGE
Two New Apparatus for Washing Gelatino-Bromide Plates. By Dr. H. Fol ... 583
How to Remedy the Bleaching of Negatives Treated with Edwards' Intensifier. By Dr. J. M. Eder ... 583
Correspondence ... 584
Proceedings of Societies ... 586
Talk in the Studio ... 588
To Correspondents ... 588

MOUNTING PRINTS.

A PHOTOGRAPHIC print derives much of its beauty from the mount which surrounds it, and no photographer or amateur who is anxious for the best results will neglect to take at least as much care as is possible over this part of the process. An inferior print can be very much improved by careful mounting; but no matter how beautiful or perfect a picture, its effect is invariably ruined by carelessness in this operation. Glass shapes for trimming prints are to be purchased at all photographic warehouses, and for portrait prints such appliances are of value; but in dealing with prints from landscape negatives it is always best to trim each print independently with a rule and a set square. The best effect can only be obtained by a careful study of each negative or print, and an extra half inch or so cut away from the sky will often improve a print considerably by giving more force to the foreground.

Mr. Henderson suggested a short time since an appliance for trimming negatives which will probably be found valuable. It consists of a glass plate, ruled with horizontal and vertical lines by means of diamond. Two adjacent sides of the print are first trimmed with the plate, and the picture is then reversed, and the sides already corrected are brought into coincidence with any set of vertical and horizontal lines which appear to give the best results.

The medium to be used for mounting requires a certain amount of consideration, as the choice depends on a variety of circumstances. Pictures printed in carbon, or platinotype, or enlargements on gelatino-bromide paper, will bear a very different treatment to prints on albumenized paper, and a medium which is possible in one case is, perhaps, not invariably to be preferred in the other. The former can be mounted with glue, and by most professional photographers glue is largely used. The quality required is the ordinary Scotch glue, which is broken into small pieces, and soaked in cold water until it has absorbed as much water as it will, when the water is poured off, and the glue melted by simmering gently over a slow fire. It should be used very thin, and as small a quantity as possible. Any portion which exudes from the edges of the print after it is pressed down is extremely unsightly, and can never be got rid of without damage to the mount. Recently, Mr. Philipps described, at the Photographic Club, a method of mounting prints which does away with some of the troubles incidental to this operation. He employs a block of wood about three inches thick and about one and a-half inches larger each way than the print which it is required to mount. The sides of the block are bevelled down, so as to leave the plane portion remaining exactly the size of the print. The prints are laid on the block, face downwards, and the backs can be moistened and brushed with the mounting medium, without danger of leaving sticky marks on the surrounding parts of the block to injure succeeding prints. The solution which Mr. Philipps recommended consisted, so far as we could gather, of two pounds of glue dissolved in a quart of water and a quart of methylated spirit. The entire immunity from any tendency to cockle the prints, which Mr. Philipps claimed for this solution, is due to the presence of the methylated spirit. In our own work we have always preferred a pure starch paste to any other form of mountant, and for amateurs, who only mount a batch of prints now and again, the use of this medium is much more convenient than that of one requiring heat. We have described at various times good mounting materials; one which we can recommend consisted of—

Water	1 ounce
Methylated spirit	2 ounces
Dextrine...	2 tablespoonfuls

The water and spirit are mixed together, and the dextrine stirred in. This solution can be used cold, and, like the one recommended by Mr. Philipps, produces no tendency to cockle.

The prints should be carefully brushed over with a wet camel's hair brush or a sponge before pasting. This operation should not be performed hurriedly, as the ease with which a print can be made to be flat depends entirely on the amount of moisture which it has absorbed, and the regularity with which that moisture has been applied. The prints, after being well moistened, should be thoroughly brushed over with the paste, and then lifted up and laid so that the corners correspond with marks previously made on the mount. If the print has been thoroughly well soaked, and the paste has got well into the pores of the paper, it will fall at once into its correct position. A piece of smooth cream-laid paper is laid on the print, and the whole well rubbed down with the ball of the thumb or any smooth article, such as an ivory paper-knife. After a short time, the cards should be stacked together, and laid between boards under a heavy weight. When dry, the prints will have a brilliant surface, which can be somewhat improved by rolling.

◆

SOME PHOTOGRAPHIC USES OF CELLULOID.

PYROXYLINE, in the form of collodion cotton, has long been a useful servant to the photographer, and notwithstanding the present widespread use of gelatino-bromide plates, it is likely to form a staple of photographic consumption for some time to come. Its employment in the manufacture of collodion is by no means likely to soon become a thing of the past, even should the gelatino-bromide process come far more into use than it is at the present day; for, to say nothing of the use of collodion as a coating for prints, the making of collodio-chloride emulsion and so forth, it is difficult to suppose that those who have a considerable amount of regular negative work—such as the production of enlarged negatives, the preparation of negatives for photo-mechanical processes, and so forth—will soon discard collodion for gelatine; excepting, perhaps, in cases where the light fails or other special circumstances intervene. In addition may be mentioned the notable consumption of collodion for ferrotypes, positives on glass, lantern slides, and similar uses.

It appears, however, that now one principal photographic use of pyroxyline is being subjected to the competing influence of gelatine, this old photographic servant is likely to find fresh application in the form of the so-called celluloid. The substance in question, which must not be confounded with the gelatinous gun-cotton sold for photographic purposes under the name of celloidine, may be regarded as an intimate mixture of compressed pyroxyline and camphor; the camphor appearing to act after the manner of a solvent. Celluloid is sometimes prepared by kneading together the soluble cotton and the camphor at a sufficiently high temperature to partially melt the camphor, and to enable it to become incorporated with the softened pyroxyline. In other cases, the camphor is previously dissolved in carbon tetrachloride, liquefied sulphurous anhydride, or other suitable solvent. When such a course is adopted, the operation of kneading becomes easier, but means must be subsequently taken to remove the more volatile solvent used. A remarkable body of the celluloid class has recently been introduced by Mr. Parkes, of Birmingham, the pyroxyline being merely softened by means of alcohol, and then subjected to compression in steel moulds.

All these forms of agglomerated pyroxyline are remarkable for their extreme toughness and strength, and when suitably coloured are now extensively used for the manufacture of combs, trinkets, and ornaments. When subjected to a temperature of 100° to 120°, the various kinds of celluloid become plastic, and capable of being rolled out into thin sheets, or of being moulded in any required manner. A moderate proportion of white pigment incorporated with the celluloid causes the material to closely resemble ivory in appearance, and it then forms an admirable basis for carbon prints, or other photographic impressions; the result being similar to that obtained when opal glass is made use of. Thin sheets of celluloid have also been used with great success for supporting the gelatino-bromide film, the extreme weight of glass being thus avoided; and it is quite easy to strip the finished negative from the celluloid by levelling the plate and pouring on a thin layer of plain gelatine solution, care being taken that this solution is not too hot. When the double film is quite dry, a knife being introduced under one corner of the pellicle, it will be found to separate with ease; the celluloid plate being now ready for use again.

There are many ways in which the mechanical properties of celluloid may render it a valuable material to the photographer; its extreme strength and toughness making it available for the construction of dishes, baths, &c., while its general inertness towards most aqueous solutions is satisfactory, provided that the raw material has been properly manufactured in the first instance. It may be mentioned that we left two sheets of celluloid, one white and the other red, in a negative bath for over a fortnight, and at the end of the time the working qualities of the solution were unimpaired.

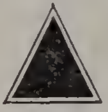
Celluloid is subject to the disadvantage of being very combustible, the burning being sometimes almost explosive in its violence.

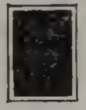
ON HALATION AND ON THE DEVELOPMENT OF SILVER IODIDE.

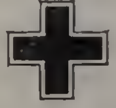
BY CAPTAIN W. DE W. ABNEY, R.E., F.R.S.

In the leader in the News for last week on the above subject I find the following paragraph, which I shall take as my text, for with due regard to what is told us in that leader, it strikes me that the explanations given are somewhat wide of the mark, as I shall endeavour to show. The leader says:—"We have heard it stated somewhere that the effect (halation) is produced by those rays which having diffused from the film in all directions, strike the back of the plate at an angle of total reflection, and which consequently will not be affected by the backing. That there must be something more than this is evident from the fact that if the plate be backed with a substance having about as high a refractive index as glass, halation is still to a certain extent evident." May I be permitted to say that I am the individual who has ventured to state what is considered a heresy, and if your readers choose to consult the pages of the *Philosophical Magazine* or of the News for 1875, I think they will find not only a theoretical explanation of halation founded on the scattering of light by the particles of sensitive salt in the film, but also a practical demonstration that such is at all events its principal cause.

Let me quote some experiments which will show that I am not far off the mark. Take a short focus single lens, and focus the sun on the screen of the camera, and expose as rapidly as possible. What will be found on development will be a minute image of the sun surrounded by a ring of reduced silver, and if from the centre of the sun's image to the centre of the ring be measured, and also the thickness of the glass, it will be found that we have, when dividing the one by the other, the tangent of the critical angle for glass. Repeat the experiment with (say) quarter-inch thick glass, and the ring will be seen to be further off from the sun. Again, if you cut out triangles and spaces of small size in the foil, press this foil so punctured in contact with a dry plate, and expose to bright light, the following figures will be seen on development.







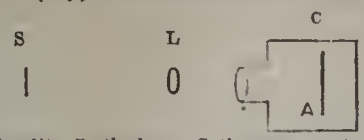
I do not say that there will be no blackening at all between the dark outline and the interior figure, but only that at the critical angle of the glass the halation obtains its maximum. The very fact that such blackening occurs points to the correctness of the theory. Again, if a prism of small angle be used instead of a flat piece of glass, it will be found that the dark outlines will not lie symmetrically round the figures, but have a shift. The conclusion drawn in your leader, that as halation is evident when the plate is backed with a substance having about as high a refractive index as glass, the above theory fails, seems to have been written under a misconception. If a glass orange flashed on one side be coated on the uncoloured side, we have a backing which has possibly a higher index of refraction than the white glass, and halation is still visible. If the writer of the article were to take the trouble to examine the light reflected from such a backing, he would find that white light is still reflected, subdued by a yellow tint. The fact is, that the theory of reflection from surfaces is not completely worked out by mathematicians, and that the nature of the light reflected by coloured surfaces has only been partially studied. It may, however, be said that no backing of any kind will thoroughly absorb the incident rays.

Next I am going to find fault with the "leader" theory of the turbidity of glass as a means of producing halation. I think the statement requires an infinite amount of modification before it can be accepted. Perhaps there is no better way of testing the matter than the following:—

Paste a piece of the foil on glass, and cut out a slit (say) one-tenth of an inch wide in it. Place a lens of (say) one foot equivalent focus one foot from the slit, and a camera with its lens as near as you like to the lens, and accurately focus the image of the slit.

Now, within the camera place a piece of glass plate one inch away from the focussing screen, insert a sensitive plate, and expose, the slit being illuminated by a strong light.

Next remove the glass plate, and in its place put a plate coated with (say) thinnish collodion emulsion, and expose



S is the slit; L, the lens; C, the camera; A, the glass plate.

another plate. The two developed images will give an idea of the relative dispersions caused by the glass and the film. I don't think after this experiment much doubt will remain as to which gives the most dispersion, and if so which is the principal cause of halation. The measurement of the outside edges of the images of the slit will give the relative dispersion of the two substances.

Were any further proof wanted of the cause of halation, I would ask your readers to examine the image on a film prepared by the old collodio-albumen process, and with that on one prepared by an emulsion. The former is almost transparent, and will give but very little halation; the latter much more, though this is not so much the case if the film be thick, and the emulsion be thick, and the transmitted light deep orange.

Colouring matter in the film itself is admissable when the matter itself be sensitive.

This sensitive matter is found in silver iodide, as is remarked in your leader. I have been too much in the habit of considering iodide inert matter; but in a long series of experiments which I have undertaken, and which will be published very shortly, I find that silver iodide is amenable to both oxalate and also to ferrous-citro-oxalate development. The former can be used unrestrained with mixtures of iodide and bromide in gelatine plates, and the latter with gelatine plates, and also with collodion films. Hence with these developers iodide is not so much inert matter, but conducive to sensitiveness. At the same time, the yellow colour noticed in the article in question, and which I have frequently described, prevents chemically effective light reaching the glass to be reflected from the back surface of the plate.

FRENCH CORRESPONDENCE.

Further Particulars as to the Transfer Process of M. Magne—Improvement of the Process of Printing on Zinc—Photographic Prints on Silk and other Stuffs—Copying Prints on Fabrics for Taking Photo-typographic Plates—Portable Photographic Apparatus.

Further Particulars as to the Transfer Process of M. Magne.—In one of my previous letters (Photographic News for 21st October, page 501) I gave an account of a process for the transfer of images printed in fatty ink, invented by M. Magne, and worked by our colleague M. Liébert. Since then I have had an opportunity of personally inspecting the working of this process; although I do not know the composition of the liquid employed by the inventor, I was soon able to understand the principle on which the process is founded. It is, in fact, the same as that of *phototypie*, without the intervention of photography, and it can be applied to the transfer of phototypic prints on stone, or on zinc, or even on paper when only one proof is required, and it makes no difference whether that is inverted. A sheet of paper covered with characters or designs drawn or printed with some kind of fatty ink is floated on the surface of a liquid contained in a basin, with the side to be transferred placed upwards—that is to say, not in direct contact with the liquid. This liquid consists of water mixed with some other liquid like alcohol, which gives it the power of penetrating quickly through the fibres of the paper. The substance of the paper is thus impregnated with moisture everywhere where the paper is white, but the water cannot penetrate through the surface of the paper in those parts which are protected by the fatty ink. The sheet is then removed from this bath, and after it has been laid on a glass plate with its moistened side downwards, a roller filled with a proper kind of fatty ink is passed over the surface. The white parts of the paper, being moist, do not take up the ink, while the fatty substance distributed by the roller adheres to all those parts where the water has not penetrated—that is to say, to the lines or characters traced on the paper. When the inking is completed, the transfer is effected in the usual way; but first the surface of the print must be washed in a full stream of water, and then dried on the reversed side by placing it on a bed of plaster about an inch in thickness. All excessive moisture is absorbed by the plaster on account of its porosity, and the paper is then placed at once under the press. With a tolerably heavy pressure the transfer is immediately obtained on stone and on zinc, and this transfer may then be used as required. The great advantage of this process consists in its enabling the operator, without having recourse to photography, to obtain rapidly and economically the transfer of a print, whether lithographic, typographic, or of any other kind; and this transfer can then be used for producing typographic plates or lithographic impressions. I have not made the attempt to repeat M. Magne's experiments, but I can understand that it is necessary to use a very fluid ink, and one which is as little sticky as possible, in order to avoid tearing off from the surface of the wet paper any fibrous particles. The ink ought to flow over the paper, so as to adhere only to those parts where characters have been drawn or printed, and not to stick in any other place, particularly if the paper has not been sized, and is consequently liable to be torn by a coating which is too thick and tacky. Phototypic prints, with half-tones, have also been transferred by this method, but not with very promising results. In order to take phototypes capable of being transferred in this way, they must be printed in a special manner by using a particular kind of artifice; but to this subject I shall take another opportunity of reverting. In my opinion, the whole process of M. Magne is very ingenious, and I think it would lend itself perfectly to the transfer of photographic prints taken by the gelatine process. The image in bichromatised gelatine, having been rendered perfectly insoluble, while the paper remains permeable to water over the whole surface which is not in contact with the print, would retain the fatty substance, so that it does not adhere to the moist paper. Very nearly the same thing as this occurs in other photo-lithographic processes.

Improvement of the Process of Printing on Zinc.—My readers will, perhaps, recollect a process for engraving on zinc, invented by Commandant de la Noë, which I described some time ago in one of my letters. This process has now been brought to a great state of perfection in the typographical office of the Ministry of Public Works, which is under the direction of M. Mongel. To a plate of zinc, mulled in the usual way, a preparation of gallic acid is applied, so as to protect the ground from any kind of fog; when this preparation has produced its effect, the plate is washed, wiped with great care, and then sensitized with bitumen of Judea. After exposure to the light for a suitable length of time beneath a copy or any kind of positive, it is developed by means of essence of turpentine, and, after being washed, it is covered with a layer of acetic acid diluted in four times its volume of water. This last operation has the effect of clearing the whites which form the drawing, without touching the ground protected by the layer of bitumen; a black ink roller is then passed over the plate, which gets inked over its whole surface. The zinc is then cleaned off, so as not to leave the slightest trace of bitumen upon it. It is then again inked, either with a roller or with a pad, and the lines which have been cleared alone retain the printing ink. To obtain the drawing cut into the zinc, the latter is first developed and washed, and the plate is then immersed for a minute in a bath containing a solution of three or four per cent. of nitric acid in water; it is then washed and cleaned with acetic acid, and the remainder of the process is the same as before. The great advantage of this process consists in the fact that—1st, the pumicing of the zinc does not require special care; 2nd, that the second sensitizing with bitumen of Judea (as originally adopted by M. De la Noë), and the filling up of the cuts by another substance, are dispensed with; 3rd, that it offers the means of obtaining prints in different colours by passing a brush filled with the proper material over the parts which are not intended to appear; but in that case the operation must not be carried out on a plate which has been etched by nitric acid.

Photographic Prints on Silk and other Stuffs.—I observe with great interest that an English firm has taken up the process of photographic printing on silk stuff of different colours, which can then be used for various purposes. The originator of this process, which seems to be an admirable one, is M. Lafon. The application of photographic printing to woven fabrics has been often attempted, but without any great measures of success. By means of M. Lafon's invention, the New Photo-Sensitized Silk Company provides photographers with sheets of ready-prepared silk, with full instructions how to treat them—that is, how to print, tone, and fix. Every professional and amateur photographer will be able to adopt this attractive method of printing, which is capable of many charming applications, with or without colours. It can be used for producing screens, fans, patterns on cushions, designs for embroidery, and a number of equally delightful things, which will open to portrait photography a wide and novel prospect. *Apropos* of this subject, I would remind my readers that an immense establishment exists in Paris for the special purpose of printing on woven fabrics, silks, wool, and cotton, to be used for a great number of purposes, such as blinds and curtains, both in black and bright colours. Cloth is also manufactured for copying plans by photography, and drawings to be used for the backgrounds of studios.

Copying Prints on Fabrics for Taking Photo-typographic Negatives.—The prints taken on the sensitive fabric of the Sensitised Silk Company can be readily copied in the same size in the camera, and give a stippled plate from which a positive image can be obtained capable of being rapidly converted into a photo-typographic plate. Silk is excellently adapted for this purpose, for all the illuminated parts have a brilliant gloss, and the contrast of the shadows is therefore more vivid. I mention this method as I have tried it with great success, and as I think it will be found to have considerable importance.

Portable Photographic Apparatus.—I am just now occupying myself with the subject of portable photographic apparatus—that is to say, with the construction of a pocket instrument to give photographs of a very small size, and then to make these photographs capable of direct enlargement by the mere fact of the stretching of the gelatine during development. At the present moment I am engaged in seeking the gelatine which can be most largely distended in water. The plates themselves will be absolutely independent of any kind of support, and will be simply formed of small square pieces of bromized gelatine of about four by four centimetres; a thickness of about 0·3 millimetres will be sufficient to make them as rigid as plates of mica. The small end of the little binocular which is to be used as a camera is turned towards the object, and carries a lens furnished with an extra rapid shutter. The larger end, which generally carries the object glass of the binocular, will be the place where the sensitive plate is held. Two sights situated at the two ends of the instrument will be used to focus the view. Very small double sides made of millboard, which by means of a double curtain are rendered perfectly impermeable to light, will enable the operator to take two views in succession, so that with only a very slight weight, he will be able to carry with him a supply of more than twenty plates. The efforts which are being made in this direction by several skilful inventors, and especially by our ingenious colleague Mr. Bolas, will, I hope, have a great effect in popularizing the art of photography. Leon Vidal.

HALF-AN-HOUR ON PHOTOGRAPHIC MATTERS.

BY W. D. VALENTINE.*

In the transition state in which photography has been placed by the advent of gelatine bromide plates, it has been a matter of considerable difficulty for me to choose a subject to talk about to you to-night. I am not sufficiently up in gelatine work to speak of it with any degree of confidence, and I am afraid a paper on wet collodion would have appeared out of date. I intend first to say a few words about light, not from any scientific point of view, but merely from observations I have made during a good many years of constant landscape work; then I propose reading a few notes on some difficult subjects I have had to photograph in Scotland. About the first thing a man thinks of when starting for a day's landscapes work is, how is the light, and which way is the wind; and the two have a most important bearing on each other. A good many years ago, when photographing along with the late Edward Ellice, M.P., one of our earliest amateur photographers, my attention was drawn by him to the fact that the direction of the wind had a most important bearing on the quality of the light. He had noted that with a north wind the actinism was least, and with a southerly or S.W. greatest. Since then I have paid a good deal of attention to this, and found he was correct. When the wind has a point or two of north in it, the distance is invariably clearer, but the exposure in the camera has to be more prolonged than with a point or two of south in it. I can't pretend to explain the theory of this to you, but of the fact I am sure. Dry plate workers would do well to note also that on a day with clear blue sky and no clouds the light is much weaker than when fleecy clouds are flying in the air. In the latter part of spring we often have atmospheric effects which cause much annoyance to the landscape worker. I refer to that peculiar blue haze accompanied by intense heat, and very slight easterly to S.E. winds. The hills will appear through this quite clear and sharp to the eye, but it will be found impossible to photograph them. The appearance of the image on the ground glass at this time will generally be found a correct guide as to whether a photograph can be done. But even this often deceives. For close subjects, however, the light in this state is very suitable; the shadows of the picture will be rendered beautifully soft, but the exposure must be rather shorter than usual. In the fall of the year, perhaps the end of September or beginning of October, one often gets days with a wonderfully good light for photographing bits. The days I refer to generally commence with a sharp white frost in the morning, then the frost "loups," as the natives call it, and if it does not turn into rain, you have a day with soft grey light, very slow, but absolutely perfect for subjects such as bits of underwood, bracken, lichen-covered boulders, and rocks. In these circumstances I have found it advantageous to give prolonged exposures, and restrain in the development.

My first essay in landscape work was at Dunkeld, some years ago. At that time I had a great aversion to wet plates, with their accompanying mess and worry, and had resolved to work the honey process, with which I had previously got some good results. This process, to the best of my recollection, consisted in first sensitising the plate in the ordinary way, washing, and coating with a solution of honey and water with a trace of acetic acid. The result with me at Dunkeld was, somehow or other, a hopeless mess of fogged plates, and not wishing to go home empty-handed, I omitted the washing and honey, and worked the simple wet collodion, preparing my plates in a room, and carrying them long distances, getting on the whole some good results. Then I tried the tannin process of Major Russel. As far as I remember, it was moderately sensitive, and in some respects like gelatine bromide. You could over-expose if you chose, and still, by manipulating the developer, get good results. Still, none of the dry processes then extant were equal to the wet, so I recommenced wet collodion, and have stuck to it faithfully since.

In my outfit there is nothing very novel. A Bell tent made of black and yellow and red calico, with folding tripod, and strong American elm camera-stand, form one package; plate-box with false bottom and vulcanite bath, a second; camera in strong tin box, the latter serving for water-can, a third; basket for chemicals, a fourth; lenses are carried in a small tin case leather covered. In working, my assistant carries two, and I carry the others; they can all be easily packed in a dogcart, or strapped on a pony's saddle, should I be working in hilly countries. The bulk of chemicals and plates are of course carried separately in strong baskets, tin-lined, and so stand the wear and tear of railway and other rough travelling. I must say this much for my outfit, that I have never had a negative broken in transit.

---

* Read before the Dundee and East of Scotland Photographic Association.

After detailing some early experiences of rough landscape work, Mr. Valentine continues :—

Did any one here ever try to photograph a birch tree? We will suppose the case of a man who wishes to distinguish himself in this way. He is living in some out-of-the-way Highland glen, and experiencing, perhaps, not very good weather. He spends a good deal of his time looking out for points, and comes one day to a fine specimen of the silver birch, with a nice foreground of bracken and litchen-covered boulders. He resolves at once to make a picture of that tree, but won't hurry. He must have an out-and-out good day; no use trying it unless. More bad weather, perhaps, but still he is sanguine of that fine morning that is to come. He is working wet plates, so has seen to a good place for his tent, and to water being handy. He has got the people at the inn where he is living thoroughly impressed with the importance of his being called up to a five o'clock breakfast the first fine morning. It comes at last. He breakfasts—if a wise man—well, though at a somewhat unlucky hour, and he and his help start with cameras, &c. The morning is splendid (one only sees such weather very early in the morning), not a breath of wind, brilliant sun, and scarcely a sound to be heard. It has been a slight frost through the night, and the first heat of the sun is gradually raising it, and so softening the somewhat hard outline of the hills. He comes to his tree. How magnificent it looks—every twig still, and clearly defined against the brilliant blue of the sky. A few white streaks of cloud are now appearing, but they are welcome; just the thing to soften the light. Now he pitches his tent. His assistant gets water ready. All his chemicals he has made sure of beforehand. He resolves not to spoil his chance of a perfect picture by any undue hurry. He sponges out tent and camera, focusses carefully, adds, perhaps, a few twigs or stones to the foreground. No need for hurry this morning; not a suspicion of wind, and the bit of distance in the composition getting every minute more mellow. The fleecy clouds, too, now fast rising, are illuminating the shadows wonderfully. He coats his plate with scrupulous care, gives it just the right time in the bath, and, everything ready, "now for the tree." The slide in the camera, he will give a full exposure (say twenty-five seconds), and stop the development, if needful. Watch in hand, he uncaps the lens; 1, 2, 3, whiff! On goes the cap; a gentle tremor disturbs the upper twigs. Never fear, it will soon settle. But it don't. He stands eagerly, but patiently, waiting. Sometimes a lull comes; up goes his hand to the lens. No use; if one part is still, another moves. He keeps cool (say) for ten minutes, hoping against hope, painfully conscious that his plate is fast drying, yet afraid to leave and go into his tent to prepare another, lest he should lose a chance. Then he begins to feel like the general in the Breitman ballad—

> "Who did not say von prayer,
> And did not sing von psalm,
> But took his pipe out of his mouth,
> And slowly he said d—— "

perhaps some wicked person in the room will supply the word to rhyme. The wind is up now, a fine bright breezy day, but utterly useless for birch tree photography. This was the meaning of the fine fleecy clouds rising with the sun. He packs up, feeling rather hurt at the way he has been done; if he had only hurried a bit he might have had it; however, no good grumbling, so off to something else. But we will suppose our birch tree photographer is a determined man, and has resolved to do that tree, and to do it well, too. He is in luck, perhaps, for next morning is as fine as yesterday, and he worries the people at his hotel with a slightly earlier start. This time he will hurry up a bit, gets over his (say) mile or two of roughish walking quicker than yesterday. Arrived at tree, won't take time to sponge his camera and tent; tells his assistant to look sharp about that water-can filling; gets his camera up and focusses, plate carefully prepared, and now for it. Watch in hand, he uncaps the lens, watching narrowly every twig. Ten, twenty, thirty, and not a breath of wind; he has got it at last. He enters his tent, sees all light carefully excluded, takes his plate out of the slide. With a steady slow sweep, the developer is sent over the plate; quickly the high-lights appear, and more gradually the beautiful details, for bark and foreground he has purposely over-exposed, and will stop the development at the right moment with the contents of his water jug. He does so, but alas! in addition to the water the plate receives, say a biggish piece of jagged bark or hard leaves which leaves a *fac simile* of itself on his cherished tree. Bang goes the tent cover; the wind is up again, and his chance for the day gone.

Now, were he a dry-plate worker, he starts as described, has no water to get, no tent to set up. The tree looks perfectly still, his exposure is less; but he has inward misgivings that something was moving, and has to carry this weight on his mind till he gets home. He knows he cannot develop gelatine plates properly till he is in his own well-appointed dark-room. When he does get there, perhaps a few weeks after, he may find his plate a gem, or the other thing.

Though the dry-plate worker gets many a chance that the wet-plate one loses, still there is an amount of satisfaction in knowing your result before you leave the spot, that can never be felt with gelatine plates; and I may add, as far as my experience goes, given subject, light, &c., equal, finer results are still to be got with the wet than the dry. Personally, I have a great love for the beautiful wet collodion plate. You cannot work wet and dry plates at the same time. I (as I daresay many others) have tried it with the usual results. Given a good subject, &c., up goes the old tent, "and I'll make sure of this anyhow." A doubtful light or indifferent subject comes. "Oh! it's not worth setting up the tent for this; we'll try a dry plate." And the results are accordingly.

There is an old Scotch song runs—

> "It's weel to be aff wi' the auld love,
> Afore you're on wi' the new."

And a very true thing it is, I have no doubt, but difficult to follow in our case. I daresay all photographers have had a great love for our auld love wet collodion, when here comes, to disturb our happiness, a new love, "young, it is true," but who shows promise of greater beauty and goodness than the auld, and the two loves won't agree; you must give up one or other. The auld love has been a true and steady friend if used well, given at times, it must be owned, to its equivalents of little feminine weaknesses—fogging, getting out of sorts, &c.—but still a friend you could depend on if given the due attention a love requires. What are we to do? Well, there are no ladies here, so I will tell you. Have a day with them, now and then, alternately; leave the auld love at home, and have a quiet excursion with the new all by herself; then, and only then, you will find out her good qualities, and her little fits of capriciousness will show; give her a fair trial, and if she prove the best, off with the auld love for good, and take your chance of an action for breach of promise.

In photographing studies of animals, I have not had much experience, but in the way of animals of various kinds making studies of me, my experience has been varied and at times painful. A well-developed Highland bull makes a splendid subject, and provided there is a good fence between you and him, a safe one; but suppose you are busy photographing some bit of landscape, and the afore-mentioned bull takes a fancy to make you the object of *his* study, he being quite pleased to omit the fence, the situation becomes, to say the least, unpleasant. My first professional interview with a bull was very nearly being my last as well. I had gone into a field where there were some cattle, to photograph an old castle, and when busy focussing, heard a row behind, looked round, and saw his lordship in full charge for me. I just managed to reach and throw myself and camera over a wire fence, he kindly endeavouring to assist me with his horns, and got off with no worse results than a broken camera. A great deal of no doubt well-meant advice is given by different people as to the most effective modes of action to be followed if confronted with a bull. Stones or strong language his bovine majesty has a profound contempt for. The old saying, take the bull by the horns, is, no doubt, a wise one, but does not solve the most difficult part of the problem. Granted yo uget your bull by the horns all right, you can't hold on for ever, and what are you to do when you let go?

While photographing on Loch Awe this spring, I had a considerable amount of annoyance caused me by a swan. A pair of these birds had made their nest on a small island near the point I had fixed on for my picture of Wilchurn Castle. Whenever our boat appeared in sight, the male bird gave chase, actually attempting to board us. I managed to get ashore, and my boatman began to feed him with part of his lunch, which kept him in a good humour till I got a plate of him with drop shutter. Each day we went there he contested every inch of the way. We got the better of him at last by carrying a lot of small gravel in the boat and throwing handfuls at him; big stones he could dodge very cleverly, but the gravel puzzled him.

Notes.

Dr. Hermann Vogel is engaged upon some interesting photo-metrical researches, the results of which he will shortly lay before our readers.

An Italian exploring expedition starts for India in a few weeks, carrying with it an extensive photographic outfit, comprising, among other things, 5,000 gelatine plates.

A line photo-engraving process of a most simple and complete nature was brought before the French Photographic Society by M. Gobert on Friday last. M. Gobert's name will be remembered in connection with the efficient photographic assistance he has rendered to the Bank of France for the discovery of forgery and illegal tampering with documents.

Mr. Léon Vidal tells us that it is proposed to hold in Paris an official exhibition of "Fine Arts applied to Industry," in August and September next. Photography will be admitted—that is to say, pictorial photography, and reproduction of fine art objects—and in all probability the gathering will be international. The exhibition will be of importance, if but for the fact that it is the first occasion that photography has been recognised as a fine art.

Captain Abney and Mr. J. W. Swan will be among the Friday evening lecturers at the Royal Institution after Christmas.

We mentioned a short time back the circumstance of some photographs being taken under fire during the war between Chili and Peru. We have now had an opportunity of seeing a series of fifteen of these pictures brought to this country by Mr. Edward Madge. Some of these are very interesting. In the "Battle of Chorrillas," the first division of the Chilian Army attacking the "Morro Solar," we can perceive the line of battle, and even make out detached bodies of troops under fire, the aspect of things being no more exciting, however, than that afforded by an Easter Monday Review seen at a distance.

"Part of the battle-field of Chorrillas—strewn with the dead," conveys a more striking idea of the horrors of battle; but even here there is nothing but the commonplace to look upon, and "pomp and circumstance of glorious war" are entirely absent. In one part of the far-stretching fields are to be seen tiny black heaps, over which here and there stand groups of soldiery. A few horses or pack mules are to be seen evidently freighted with ghastly burdens, for at this spot the dead are being collected for identification and burial. "The Battle of Miraflores—Wounded and Dead Chilians," shows us a group of quick and dead, but the horror or prestige of the scene here is also considerably marred by commonplace surroundings. In a word, vivid as the pictures are, they are totally devoid of any romance; but herein, of course, lies their great value. They show us battle-fields as they really are.

Captain Abney has been good enough to favour us with some interesting remarks upon halation, which our readers will find discussed with much tact and circumstance; still, we cannot help thinking that ours is a clearer explanation of the moot points connected with halation than his.

The production of an artificial light by burning certain bodies in oxygen has, we are glad to see, been receiving the attention of Mr. John Maclellan, who recently read a paper on the subject before the Glasgow Society. In one of the recent YEAR-BOOKS, Mr. Spiller detailed certain experiments in connection with this subject, but notwithstanding its interest for photographers, little has since been done. Mr. Maclellan now promises to take the subject up systematically.

Mr. William England sends us some charming Christmas and New Year cards. A small sheet of opaline gelatine about four inches square and edged with gold has mounted upon it a circular photograph, one of Mr. England's exquisite Swiss series. The charm of the tiny picture is further enhanced by being coloured, by hand, in a most delicate and finished style. The opaline gelatine supplies a pleasing contrast, and seems almost to add transparency to the little painting, which has the effect of a rare miniature upon ivory. If photographers can produce such Christmas cards at a reasonable price, the days of lithographed cock robins upon holly bush and snow are numbered.

Does the photographing of criminals really lead to their identification? An answer to this sceptical query is at once afforded by the Berlin police, who not only keep a criminal album, but note its uses. Last year, it seems, no less than 139 persons, arrested for crime in the capital and suburbs, were identified by the album, whose names were either entirely unknown, or who had given false ones. This number—representing nearly one-third of the total arrested for serious crimes—could not have been identified, say the police, without the album. In Berlin, they wisely do not pourtray every convict, but simply habitual criminals and those against whom heavy charges have been brought.

Speaking of criminal photography, it may be mentioned that an exhibition, similar to Madame Tussaud's, has recently been established in Paris, in the Faubourg Poissonière, which has its attendant Chamber of Horrors. The Préfecture of Police allowed the artists engaged in working for the Eden Gallery—for so it is termed—to study its photographic collection. Troppman, who killed a whole family at Pantin, Billoir, and Dumollard are the equivalent of our Mannings, Rushes, and Palmers. The Paris chamber is in a crypt feebly lighted, and the figures are exceedingly realistic, thanks, it is said, to the admirable way in which Paris has secured camera pictures of its horrors. We ourselves can testify to the fact that the photographic establishment of the Préfecture is, at any rate, ably managed.

Mr. Muybridge's new book of photographic feats is certainly full of wonders. The acrobat in the act of throwing a somersault, not taken at once or at twice, but in many positions, as he twists and twirls in mid-air, is one of the most striking of the scenes, and as good as the horse studies which have made Mr. Muybridge's name famous. There is no half-tone in the pictures, and they are, in fact, only silhouettes, for in the minute fraction of a second for which the plate is exposed, half-tone could hardly be secured. The object is placed against a white background sloping towards the light, and it is this white surface temporarily obscured in part by the moving figure that is photographed rather than the object itself.

Bichromated gelatine has found many applications already; here is another pointed out by a German contemporary. A strong solution made up of five parts of gelatine and one part of bichromate may be employed for cementing broken glass articles. The fractured surfaces are coated, tied firmly together with string, and then exposed to light for a few hours. Even hot water will fail to bring about separation afterwards, and the join is scarcely perceptible.

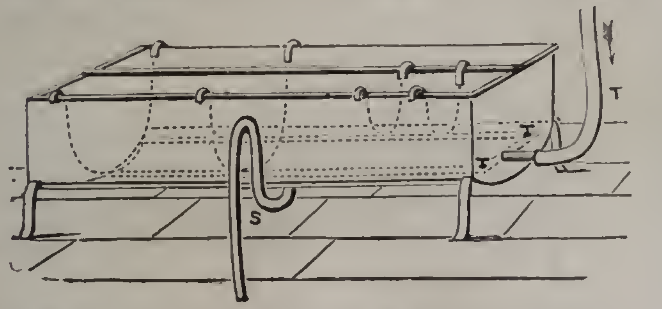
◆

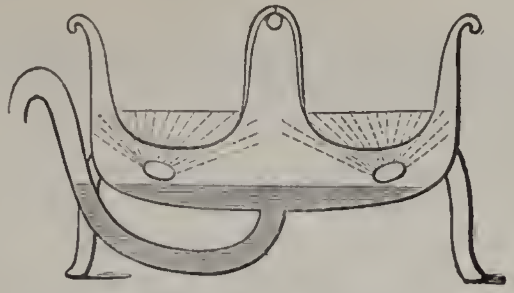
TWO NEW APPARATUS FOR WASHING GELATINO-BROMIDE PLATES.

BY DR. H. FOL, OF THE UNIVERSITY OF GENEVA.

In order to get permanent results with the gelatino-bromide process, and to obtain negatives capable of being intensified without running the risk of spotting, the plates must be submitted to very prolonged washing; this constitutes one of the great disadvantages of this process, as compared with collodion. My object has been to make the operation of washing perfectly automatic, so as to avoid loss of time; and I think it will be seen that I have been successful.

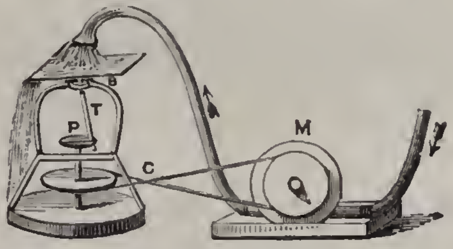
The first apparatus to which I desire to draw attention is a vessel in which plates can be rinsed after issuing from the hyposulphite bath. This apparatus is made entirely of tinned copper, and consists of a cistern in the form of an elongated rectangle, curved at the bottom in the shape of a gutter, and resting on four legs. Inside, along the bottom, there are fixed two tubes, pierced on their upper surface with a large number of very fine holes. The water is conveyed to these tubes by the pipe, T, and spouts upwards in a fine rain. Gradually the cistern gets filled, and the water, as it rises, is kept in continual agitation by the pressure of that issuing from the fine holes. When the cistern is nearly full, the siphon, S, made of a large-bore pipe, comes into action, and the cistern is emptied in about a minute; this alternating action of filling and emptying goes on automatically, without needing any attention. As they are taken from the hyposulphite bath, the plates are placed in the cistern with the film side downwards; to hold them, bent iron wires covered with caoutchouc tubing are hung from the sides of the cistern. These wires are doubled into hooks at the ends, and the middle is bent round like the ribs of a ship, so that the plates come into contact with them only at their extreme edges. For smaller plates I use shorter wires, which are suspended at one end from the edge of the cistern, and at the other from a movable rod running along the length of the cistern (see the figure).





An apparatus for washing plates has been for some time on sale in England, but in this, the plates are placed in a vertical position, and the water reaches them from above the cistern. The consequence of this arrangement is that the gelatine film is very unequally washed, and that the water which collects at the bottom of the cistern is not kept in motion. My model, which I have had constructed here in Geneva, obviates all these disadvantages, and acts to perfection. It washes the plates very briskly, and never injures the film.

After an hour of this washing, the plates are fixed, and then passed into an alum bath, after which they are again washed for five minutes by means of my second apparatus, which I will now describe. The water is brought at a pressure of about one atmospheric through one of those elegant hydraulic engines manufactured by Messrs. Schmidt and Co., of Zurich. It sets this engine in motion, and then, passing through an india-rubber tube terminated by a rose, falls upon the plate in a fine rain. The motion of the engine, M, is communicated by an endless cord to a wheel on which, by means of the pivot, P, is supported a disc pierced with a number of holes. Fitting in one of these holes is a rod, T, which is compelled to move with the disc, but without revolving on itself; it is, in fact, articulated at B by means of a double joint like that used for suspending lamps on board ship. At the other end of the rod, T, are a couple of hooks, moving in grooves to which the plate to be washed is attached. Observe that the plate does not turn on its axis; it is merely inclined successively in every direction, and it will be noticed that the water always falls on the part of the plate above its centre, to run off at the opposite corner. The chief force of the jet never attacks the same part of the plate for two seconds successively, and, for this reason, a plate whose film has partially separated from the glass can be left for half-an-hour under a brisk stream of water without the evil being aggravated. It seems scarcely possible to restrain a laugh when seeing this apparatus in action, and imitating so perfectly the motion of the photographer's hand in washing a plate under the tap, although effecting its purpose with much greater completeness. Another advantage of this abundant rinsing is that it removes the opalescent fog which plates sometimes have on being taken out of the alum bath. Only since I have had these apparatus for washing have I been able to work the gelatino-bromide process really expeditiously.



◆

HOW TO REMEDY THE BLEACHING OF NEGATIVES TREATED WITH EDWARDS' INTENSIFIER.

BY DR. J. M. EDER.

It is a known fact that Edwards' intensifier is not of a durable character. There is produced in the image a sub-iodide of mercury (proto-iodide of mercury) which is not only changeable in light, but also undergoes alteration in the dark in a damp atmosphere.

The re-intensification of a negative after treatment with Edwards' intensifier is a difficult matter. Sometimes the end may be attained by the use of an alkaline pyrogallic developer. This must be employed without the addition either of a bromine salt or of ammonia. The negative is poured over with the solution, and thereupon becomes darker. This I recommend only as tentative; the application of the pyrogallic acid developer cannot, however, injure under any circumstances, and it may, as I have said, help out of the difficulty.

A second plan is the following. The plate may be treated with a solution of sulphide of ammonium, whereby sulphide of mercury is produced. This latter is also darkly coloured, and hence may assist in the matter.

As a last resource, the well-washed plate may be re-intensified with silver, in the manner indicated by Abney and Carroll. There is, perhaps, a little risk incurred, for the sorely-tried plate may give way after so much treatment, or rather ill-treatment. But nothing venture, nothing win; and by this means it may sometimes be possible to save a fleeting negative.

◆

Correspondence.

DEVELOPMENT OF GELATINO-BROMIDE PLATES.

Dear Sir,—In a recent issue of the News I observed that at the third Technical Meeting of the Photographic Society of Great Britain, held 28th July last, Captain Abney asked if anyone had tried Col. Stuart Wortley's plan of using ammonia first.

With reference to this, I beg to say that I have for many months past used the ammonia solution given in the formula of Messrs. Wratten and Wainwright, before adding the pyrogallic acid, whenever I thought the plate under-exposed in the camera. My adoption of this method of working, however, was the result of an accident. While developing a plate I was greatly surprised that no image would appear, and was about to throw away the plate, when I found the pyrogallic acid, which I had intended to have been in the developer, still on the pan of the scales. I then thought I would try the effect of the developer, as it was, a little further, adding the pyrogallic acid. The result was that in about a minute I obtained a fully developed picture, bright and full of details—a good and quick printing negative.

After treating several other plates in the same manner I came to the conclusion that, in any case where I thought a plate under-exposed, the above method should be adopted. But up to last Saturday I did not know that Col. Stuart Wortley had suggested the plan. Now, when a plate is under-exposed, I add from 5 to 7 drops of the solution of ammonia (Wratten and Wainwright's formula) to each ounce of water. I allow this solution to remain on the plate about one minute, and then add from 1½ to 3 grains of pyrogallic acid to each ounce of solution, adding more ammonia solution when the high lights are well out, so as to make up 10 drops to each ounce of developer. About a minute is the time a plate takes to develop by this method.

In conclusion, I wish to say that my only reason for calling your attention to the above facts is to show that two persons may walk in the same path, quite unknown to and independent of each other. R. Tudor Williams.

MR. HOLROYDE'S MULTIPLE SLIDE.

Sir,—As a constant reader of your paper, allow me to suggest that a description of Mr. Holroyde's multiple slide for paper, as referred to in last week's News, would be of general interest; and I for one should be glad to see a detailed account of it. John Anselm.

Sir,—Mr. Holroyde, in a letter headed "Negatives on Paper," which appeared in last issue of Photographic News, says he will communicate information regarding the slide he has invented if asked. Would he be good enough to do so through the columns of your paper, and also state if the slide referred to can be purchased, and if so, where?—I remain, sir, your obedient servant,

T. L. M. C.

PS.—Would it be any advantage to wax or varnish the paper negatives for printing purposes?

COMMERCIAL DRY PLATES.

Dear Sir,—I can sympathise with Captain Turton, for I, too, have had bad plates sent me occasionally. I have also had bad meat from my butcher, and in both cases I have acted in the same way, for neither butcher nor plate manufacturer could compel me to buy against my will—I sent the plates back. For this reason I do not think that it is worth while discussing whether or not plate manufacturers systematically supply bad plates. Purchasers (as in the case of butchers' meat) have the remedy in their own hands.—Yours truly, T. T.

Dear Sir,—In your edition of this week, an effusion of Captain Turton's appears, which I have read and re-read without, up to the present, arriving at any conclusion as to what the gallant Captain really wants to say or prove. He repudiates the interpretation placed upon a previous letter of his by the author of "Photography and the Public," appearing in your issue of November 11, but in my opinion, on the basis of a common-sense argument, that interpretation was a perfectly natural one, and very correct.

It is perfectly certain that Captain Turton cannot have the remotest idea how a dry plate manufactory is conducted, or in what manner the plates are sent out. He goes back to 1876 or 1877 (*he* don't know which, and I am sure *I* don't) for a statement (and a then perfectly correct statement) of the late editor's, to support his case. Does the Captain suppose that dry plates or their manufacture are *in statu quo* as they were six years ago? I wonder in what factory children are employed in either coating or packing plates at the present day. Possibly such a place may exist, and possibly Captain Turton may deal there; I have never met anyone else who ever did. Any person who knows anything of the gelatine process must be also aware that the coating of gelatine plates is an operation entailing the greatest care and dexterity. Every batch of emulsion is tested in a score of different ways, both before and after coating, and at time and finish of packing. On the appearance of any defect locally in a plate, it is thrown out at once, and when the whole batch, from some cause or another, appears defective, they are at once placed in the copper and washed off. It would be impossible in any well-managed factory for bad plates to be mixed with good ones accidentally, and however much Captain Turton may endeavour to interpret his own letter, he will never succeed in making me view it in any light but that of a ridiculous charge against the whole body of gelatine plate manufacturers. He certainly must be a most unfortunate individual, for, *mirabile dictu*, we find no one supporting him by a similar complaint to his own. I am sure that no manufacturer would refuse to change, without hesitation, plates guilty of the defects named by Captain Turton, provided they were not caused by bad manipulation. Whenever I have been the purchaser of dry plates, I have found that by cash with order I have never failed to obtain a reliable article. Once I had a large number broken from insufficient packing, and the firm who supplied me made good my loss without demur, on the production of proof that the fault was theirs, and not mine.

I hope no one will be appalled by the astonishing statement made by the Captain "that hundreds, indeed thousands," of dry plates have been worked by him; for my own part I can only say that I should never have thought it. At the same time, I am sure that everyone will agree with me when I say that even supposing that "millions" of plates had been developed by Captain Turton, yet still he might have something to learn. It is refreshing to read the way in which he makes an attack in a hypothetical manner upon the photographic journals, and then suddenly retires from that attack and honours them with his praise. He need scarcely fear that anything he can introduce to the photographic world *for its benefit* will be withheld by any journal; and in future, before he talks of establishing his position, he should remember the advice of Mrs. Glass in her book on cookery, where she says, "*First catch your hare, and then cook it.*"—I am, sir, &c.,

"Not at Sea."

Sir,—In your issue of December 2nd, Captain Turton asks, "Why are plates sent out from the same maker, some of which produce excellent negatives, while others, worked by the same operator and with the same chemicals, produce only ghostly images, or negatives covered with spots, moons, comets, or stars?" I understand the gallant gentleman has been asking this question in various forms, and of various people, for some time past, and as no one else seems inclined to answer him, perhaps you will grant me space to do so. First, however, as the Captain seems to be a somewhat choleric individual, and as I have not had the gloves on for many years, I must beg of you to grant me the protection of an *alias;* and please, Mr. Editor, if he should call on you, don't tell him where I live.

The two great difficulties Captain Turton encountered while he was developing these thousands of commercial dry plates seem to have been (1) want of density, and (2) spots of various kinds. He does not mention fog, halation, green fog, frilling, or any of the other ills which gelatine films are heir to, but confines himself to weakness and spots, and wishes to know why the maker sent them out. Well, sir, I speak diffidently; I have these plates "by hundreds and by thousands" very much on my mind, for I seldom develop a dozen plates in a week, except during my annual "good time;" but I guess the reason the maker sold those bad plates was that he did not know they were thin and spotty, and that if Captain Turton had written to him and sent him a plate or two to re-test, the maker would have said that he would replace the plates, and that he was much obliged to the Captain for pointing the matter out. He (the maker) might also possibly have added that though he wished to sell a thoroughly reliable plate, knowing that that was his only way of keeping up his sales, yet the peculiarities of gelatine emulsion work are such that if the patient Job himself had been engaged in it, the devil would not have thought it worth while to get him worried with boils or anything else, but would just have let him go on trying to make good plates till he broke his heart and died.

In his last paragraph Captain Turton is at his best. Among advertising dry-plate workers we find the names of Mawdsley, Swan, and Thomas. Are these men, and others like them, who have laboured to make photography what it is, to be called "a clique of traders?" And will not the photographic world laugh when it reads the darkly-expressed insinuation which Captain Turton makes in his penultimate paragraph, to the effect that you, sir—you and your colleagues, contemporaries, and associates—are panderers and time-servers, ready to suppress anything that might be distasteful to the sensitive conscience of the rascally plate-maker?—I am, sir, your most obedient servant,

John Doe.

LANTERN SLIDES AT THE SOUTH LONDON SOCIETY'S POPULAR MEETING.

Sir,—As the next meeting of the South London Photographic Society is to be a popular meeting, as it is called, which is an exhibition of lantern slides by members and friends of the Society, and as Mr. F. A. Bridge and myself have undertaken to exhibit any slides that may be sent, I wish to make a few remarks in respect to the sizes of slides.

Some two years ago, when I exhibited for the Society on a similar occasion, many slides were not handed to me until after the lights in the Hall were turned down. I think it would be much better if slides, with any explanation that may be required to be given, were, if possible, sent addressed to me at the Society of Arts, John Street, Adelphi, London, during the day or before the exhibition commences, so that we may arrange and classify them. Mr. Bridge will undertake to describe the slides submitted. On the occasion before mentioned, several transparencies, whole plate size, were handed up to me to exhibit, and various other odd sizes, which were of course impossible to show. For those who are not conversant with the sizes of slides required for the lantern, I may state that the size most suitable is three and a quarter inches square; but any way, they must not measure more nor less than three and a quarter inches high, so as to fit the ordinary frames (or blocks). Several slides were also handed to me which were far too dense to show well. To get a good result, the high lights of the slide must be perfectly bare glass, and only the extreme shadows opaque; the slightest deposit or veil in the high lights is fatal to a good result on the screen. I trust all those who wish to exhibit will comply with the above conditions, so as to avoid anything like confusion, and that we may have an enjoyable evening. Mr. Bridge will also make arrangements for a little music. I shall be pleased to give any information I can.—Yours very truly,

William Brooks.

Laurel Villa, Wray Park, Reigate, Surrey.

HALATION.

Dear Sir,—With much interest I read your article on "Halation." Last year I was much troubled with this evil, which I tried to cure (without any great success) by the application of a black benzole varnish to the back of the plate. I sought my remedy in another direction, and think I have found it; at least, the fault has not shown itself this summer, even when taking portraits right against a window in my drawing-room; all my landscape pictures (I make no other) being also free thereof.

Halation, in my experience, is simply due to under-exposure and forcing the (ferrous-oxalate) development. The iron developer has a tendency to bring out the well-lighted parts very strong; consequently, when the exposure has not been long enough to get the details in the dark parts, shadows, foliage, &c., we are apt to force the development, and the bright details which stand out against the sky are sure to show the defect. The development should be quick enough to get at once the various gradations, but not so long as to cause a spread of the silver molecules in the high lights. It may be that I am wrong, but I think experience has shown me to be right.

I now beg to ask you for some information. What is hydroquinone? Who sells it in London, and at what price? Perhaps the article is known here, in the pharmacopœia, under a different name. With very good success I tried Dr. Eder's chloride of silver emulsion; it gives very good transparencies: I found it fairly sensitive (about as much as wet collodion) in the camera. The development has, however, one very great inconvenience, viz., unless it be thoroughly washed out, it must spoil the fixing bath; so that sulphur toning sets in very soon, giving very fine black tones, which fade almost entirely in the course of a couple of days. What we want most, I think, *is a new fixing agent* for gelatine plates in general; since, unless you have special appliances, it is almost impossible to get rid of the hyposulphite, the negatives are sure to spoil sooner or later. Yesterday I tried sulpho-cyanide of ammonium, when the picture, gelatine and all, vanished from the glass, running off in streaks. This was quite a new experience, and the more sensational, as I had always read that this fixing agent was quite innocuous, without any effect on animal tissue.

I read so much of instantaneous shutters in the News, that I, and perhaps others of your many friends, should be glad to know what subjects (seascapes, clouds, and open views excepted) admit of an instantaneous exposure? What lens is to be used, and what is the smallest diaphragm allowable? What size can the picture have *well-defined details up to the borders?* Some years ago there was a song in England about "a thing you read about, but very seldom see;" and I, for one, should be very glad to know whether, with a lens said to cover (say) 8 by 10, you can get a well-defined instantaneous picture of the same size, (say) of an avenue with foreground, clouds, and moving objects at a proper, but not too great, a distance, or whether, in such a case, a much larger instrument is required, working with full aperture?—I am, dear sir, very truly yours,

H. L. T. Haakman.

Proceedings of Societies.

South London Photographic Society.

The annual meeting was held on Thursday, December the 1st, 1881, in the rooms of the Society of Arts, Rev. F. F. Statham (president) in the chair.

The minutes of the preceding meeting having been read and confirmed, Messrs. Matthew Whiting and Matthews were duly elected members.

The Secretary then read the following

Annual Report.

"In presenting the annual report for 1881, your Committee, whilst congratulating the Society upon the success which has attended its efforts during the past year, would wish to allude to one or two matters of importance; and first they most earnestly desire to draw the attention of the members to the necessity of exerting themselves to provide a greater number of papers to be read during the year ensuing, on account of the difficulty which occasionally presents itself in procuring papers of sufficient interest for discussion. The Committee trust that, in the ensuing year, members will use additional efforts in this direction, and come forward, so that no deficiency being felt in this respect, the interest of the meetings, together with the welfare of the Society, may be enhanced. In connection with this matter, your Committee think that it would be very useful for discussion to arise from questions being asked, and when the reading of a paper might not be desirable; many points being of temporary interest. Your Committee desire to allude to the artistic competition. This, upon its second year of existence, has not proved such a success as to warrant the Committee in carrying it on for another year under the same conditions. This matter will claim the attention of the Committee early in the new year, and, if thought desirable, it may be renewed under different arrangements. Your Committee would also call attention to the out-door meetings appointed to be held during the summer recess of the Society. Two have been held during the present year; but, in point of numbers, they were not a success, the first being held at Kew, the second at Dulwich. At the latter place several members present expressed the opinion that, as the out-door meetings of the Society have resolved themselves more into social gatherings than into anything of a photographic nature, that any future meetings to be held during the recess should take place in a more central position, in order that a larger gathering might possibly be the result. This will also be a matter for the Committee to determine during the ensuing spring. The annual popular meeting for exhibiting lantern pictures in January, and the Technical Exhibition meeting in November, passed off with a large amount of success. Your Committee congratulates the members upon the addition to their numbers, there having been eight new members elected against only two resignations. During the year the following papers have been read:—"An Artistic Competition," E. Dunmore; "The Value of Photography as a Critical Agent," F. F. Statham; "Two Practical Hints," L. Warnerke; "Gelatino-bromide Paper," W. T. Morgan; "A Gossip with Old Friends," G. Croughton; "Hot Weather Emulsion and the Development of Gelatine Plates," Archer Clarke; "On the Reproduction of Small Negatives for Single Transfer Carbon Printing," W. P. Wilkinson. The following gentlemen have exhibited matters of interest at the meetings:—Messrs. F. York, W. Brooks, F. Howard, Payne Jennings, G. F. Williams, J. Nesbitt, W. M. Ayres, W. England, C. G. Cutchey, L. Warnerke, G. R. Baker, W. C. Hughes, J. Otway, W. T. Morgan, G. Smith, Wilkinson and Co., A. Cowan J. Werge, A. L. Henderson, J. Harrison, J. F. Shew, T. Bolas, and A. J. Jarman. In conclusion, your Committee trust that, by the earnest co-operation of all the officers and members of the Society, its prosperity may be continued with renewed vigour, and its sphere of usefulness greatly enlarged during the ensuing year. The Treasurer's report showed that the Society was in a flourishing condition, with a balance in hand of about £15, the accounts having been audited by Messrs. Adkins and Harrison.

The election of officers for the ensuing year was as follows:—

President—Rev. F. F. Statham, M.A.

Vice-presidents—Messrs. W. Brooks, F. Howard, T. Hughes, P. Mawdsley, Edwin Cocking.

Committee—Messrs. T. Bolas, W. B. Bolton, W. Cobb, A. Cowan, E. Dunmore, E. W. Foxlee, L. Warnerke, G. F. Williams.

Hon. Treasurer—Mr. F. A. Bridge.

Secretary—Mr. H. Garrett Cocking.

Mr. Bolas proposed a hearty vote of thanks to the President, and said that the Rev. F. F. Statham's genial countenance at all the meetings of the Society was a bond of unity among the members. This having been passed by acclamation,

The President, in responding, said he had come straight up from Brighton to be present at that meeting. He always was at their service; he never came to the meeting without going away benefited in some way or other. The President concluded his remarks by saying that he had derived much pleasure from the past meeting, and hoped to do the same from the future ones.

Mr. Foxlee, in proposing a vote of thanks to the Society of Arts (which was seconded by Mr. Brooks), said it was through the kindness of Mr. Wood, the Secretary, that the South London Society was allowed to meet in that room.

Mr. Wood, in reply, said that it gave him and the Society of Arts pleasure to be of service to the South London Photographic Society.

Mr. Mawdsley proposed a vote of thanks to the Secretary and Treasurer, and said that however well the technical part of the Society was carried out, the business matters had to be attended to, and he was sure the Treasurer took them to heart, and carried them out ably.

The motion was seconded by Mr. Dunmore, and responded to by the Secretary and Treasurer.

Mr. T. Bolas then showed some of Fletcher's gas furnaces in action, and showed that by means of a blow-pipe worked by a foot bellows, the heating power of the gas was considerably increased, so that in five minutes he melted five ounces of silver. This was a very convenient method, as these gas furnaces could be lighted and used at once, and extinguished as soon as they were done with. A bath-brick was the best thing to pour hot metal into. Mr. Bolas also showed a furnace worked on the same principle for heating iron bars; also one for glass blowing, in which the flame could easily be reduced to a small one, or raised to a roar. Great interest was taken by the meeting in the matters shown by Mr. Bolas, and many questions were asked and answered.

The room was then lighted by electricity, and Mr. H. Trueman Wood gave a short account of an attempt which had been made to photograph the audience at a meeting of the Society of Arts the previous evening by the light of six electric lamps which were there burning. The speaker said that exposures of a minute with a Dallmeyer's rapid rectilinear of 11 in. focus had given mere ghosts, and none of the other lenses had been more successful, which was doubtless owing to the thick opal glass shades with which the lamps were surrounded, the opal glass preventing the passage of the rays of higher actinic power. The lights which the members now had the opportunity of observing were worked from the engine on the Thames Embankment, wire having been laid for the purpose, and the manager of the Jablochkoff Company had kindly consented to allow them to remain this evening, that the South London Society might have the opportunity of seeing them In conclusion, Mr. Wood drew the attention of photographers to the use of secondary batteries for lighting purposes. He thought that it would not be difficult to provide a battery which, after charging by an ordinary battery, would work a light during a period sufficiently long for a portrait to be taken.

The Chairman said that all the members must feel indebted to Mr. Wood for the trouble he had taken to procure the electric light for them, and asked Mr. Wood, as he took such an interest in the matter as regards photography, whether he would not read a paper at one of the meetings during the ensuing year.

Mr. Wood promised to do so as soon as he had anything to demonstrate.

The President then stated that the Annual Lantern Meeting would be held in January, and that Mr. Brooks had undertaken the lantern part, and as this was made a popular night, some little music might be anticipated, which Mr. Bridge would arrange and superintend.

Mr. Brooks reminded members who contemplated making slides, that they must be 3¼ inches one way, or they could not be shown; the last time he undertook the management he had had transparencies handed up 8½ by 8½.

The Chairman having called attention to the annual dinner, the meeting adjourned after one of the most interesting evenings of the year.

South London Photographic Society Dinndr.

On Saturday last, December 3rd, a large number of the members attended the dinner at the Holborn Restaurant, and after a most excellent repast had been partaken of, the usual toast of "The Queen" was duly honoured.

The Rev. F. F. Statham then proposed the "South London Photographic Society," and the Secretary having responded, the "Photographic Society of Great Britain" was proposed, it being coupled with the name of Mr. Edwin Cocking.

Mr. F. A. Bridge then sang "That Awful Little Scrub," and

Mr. E. Cocking, in his response for the Society, alluded to the fact that six members of the South London Photographic Society were officers of the Parent Society, and twenty-eight members were common to both societies.

"Professional Photography," proposed by the Chair, and responded to by Mr. Jabez Hughes, was followed by "Commercial Photography," and "The Photographic Press."

Other toasts having been proposed and responded to, Messrs. Heaviside, Prestwich, Bridge, and Cobb sang some excellent songs, and the assembly separated at a late hour.

Glasgow Photographic Association.

A meeting of this Association was held in the Religious Institution Rooms, on Thursday, 1st inst., at 8 o'clock p.m., Mr. John Parker (president) in the chair.

The minutes of last meeting were read and approved of, when the Treasurer read over a detailed statement of accounts, which elicited some discussion on the merits of "popular evenings."

Some photographs taken by means of the electric light were passed round and criticised; the exposures were from 15 to 30 seconds, and the negatives were taken on dry plates.

Mr. Thomson showed some photographs illustrating his method of printing-in skies. The prints were greatly admired, and the description of his method was listened to with much attention.

A short paper on "A New Photo-Chemical Light" was read by the Secretary, and some experiments showing his method of working were made (see our next).

Dundee and East of Scotland Photographic Association.

The third general meeting of this Society for the session was held in Lamb's Hotel, Reform Street, on Thursday evening, December 1st, James C. Cox, Esq. (president), in the chair. There was a numerous attendance of the members.

The minutes of last meeting were confirmed. Mr. V. C. Baird and Mr. F. Millington were admitted members of the Association.

Mr. S. Rollo read a report of the proceedings, stating that arrangements for the Exhibition in February were progressing satisfactorily, that forms and prospectuses had been sent out, that two gold, eight silver, and fifteen bronze medals, struck from fine steel dies, were already finished, and that the judges who had consented to act were of the highest skill, both in art and technicality. A store had been rented for the safe keeping of exhibits. The prices of admission and charge for advertisments in catalogues had been fixed, and it had been decided to light the hall of the Albert Institute by the electric light during the Exhibition.

Mr Roger exhibited a drop shutter, the novelty of which consisted in its being acted upon by a pneumatic tube, the chances of disturbing the camera being thereby avoided.

It was resolved that the next Exhibition of lantern slides be held on the third Thursday in January, when views in Sweden and Norway, with other attractive subjects, will be represented.

A paper read by Mr. W. D. Valentine, entitled "Half-an-Hour on Photographic Matters" (see page 580), was the most interesting feature of the evening. He brought an experience of fifteen years to bear upon the subject of difficult landscape photography, and so treated his paper that he kept his audience bound with interest.

Votes of thanks were passed to Messrs. Rollo, Roger, and Valentine.

Mr. G. D. Macdougald promised a paper for next meeting, to be held on the 11th January next instead of the 4th, on account of the Christmas holidays.

A letter received from Captain Turton, R.N., Florence, was referred to the Council.

Mr. Johnson, hon. secretary, called the members' attention to a handsome japanned and lettered case for holding the folio and records of the Association, the gift of the President, and proposed a hearty vote of thanks, which was carried.

Mr. A. Watt and Mr. S. Rollo were elected members of Council.

This closed a most enjoyable evening.

Thursday Evenings for Photographers.

A meeting was held on the 1st inst., Mr. A. Strivens in the chair.

Mr. A. J. Brown showed a transparency in a plate coated with emulsion prepared by Mr. Henderson's trituration method.

Mr. Henderson showed a negative taken during the past summer, and put away in the usual way; one half was covered with an opaque white powder, which Mr. Henderson attributed to expansion of the gelatine through damp.

Mr. Debenham thought that perhaps all the hyposulphite had not been washed out, and suggested that it should be tested with iodide of starch.

Mr. Henderson had noticed that when a somewhat porous varnish was used, breaking up of the varnish frequently occurred from the moisture of the breath during retouching. He found that the best varnish for gelatine negatives was—

Chromotype collodion	1 part
Spirit varnish	2 parts
Methylated ether	2 ,,

Mr. Brown read a letter from the vendors of the sensitized silk (the New Photo-sensitized Transparent Silk Process Company) exhibited by him at the last meeting, in which they explained that by a thirty-grain bath of carbonate of soda, they meant thirty grains to the gallon.

Mr. Cowan exhibited a frame for printing fancy backgrounds direct in the negative, thus saving double printing.

In answer to a question, Mr. A. Haddon thought the best method of recovering the potassic oxalate from the spent oxalate developer was to add sufficient caustic potash to precipitate the iron as an oxide.

Mr. Henderson, in answer to another question, said he found that an emulsion made with ammonium, instead of potassium, gave greater density, and that a soft gelatine conduced to greater rapidity. He also stated that he had been experimenting with various gums, and he found that by adding a certain gum to the emulsion, it was not only more rapid and plucky, but developed and fixed quicker; but as his experiments were at present incomplete, he did not state the formula, but promised to do so upon a future occasion.

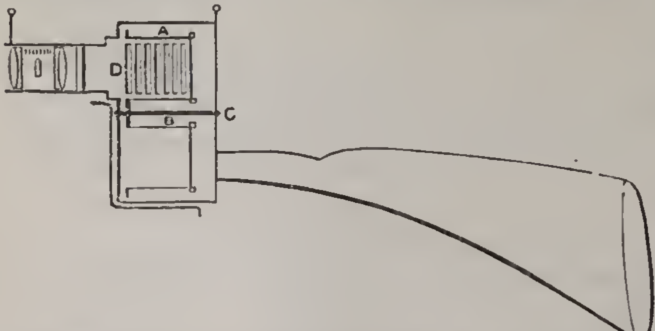
Mr. Haddon said he did not think it was necessary to use so large a quantity of developing solution as was generally the case, but that it was sufficient if the film was saturated; and he suggested the use of a camel's hair pencil for this purpose.

Mr. Brown had made the same suggestion at a former meeting, and had used it successfully with both pyrogallic, ferrous, and oxalate solutions, and believed it was the method of development of the future.

Talk in the Studio.

Photographic Society of Great Britain.—The next meeting of this Society will take place on Tuesday next, December 13th, at the Gallery, 5a, Pall Mall East, when, amongst other matters to be brought forward, papers will be read "On a New Sensitometer," by Messrs. J. D. Mucklow, F.C.S., and J. B. Spurge; also "On the Production of Blue or Brown Transparencies," by Mr. D. Woods.

A Photographic Gun.—A clever contrivance has been shown to us by Mr. C. Sands. The revolving breach consists of two cylindrical receptacles, A and B. One of these is packed full of circular plates, each plate being mounted in a light metal frame or rim. The charged cylinder being brought opposite the chamber, D, one of the plates is forced forward into this chamber by a spiral spring, which is fixed at the back of the receptacle, A. An adjustment to the required distance having been effected by the scale shown on the side of the lens tube, exposure is effected by pressure on the trigger. The empty receptacle, B, is now brought round into position, and the exposed plate is forced into it by a sliding piece not shown in the diagram. That very satisfactory results may be obtained with this apparatus we have no doubt; but its extremely murderous appearance might cause the user to be subject to rather unceremonious treatment if he were endeavouring to secure a portrait of an Irish landlord or of the Queen.



Social Meeting.—The employées of Messrs. Turnbull and Sons, Glasgow, held their annual reunion in the Assembly Rooms, Crown Street, on Tuesday, the 29th ult. At the supper the chair was occupied by Mr. R. Turnbull, who spoke of the good feeling such meetings promoted, and his own pleasure at being present. Dancing and singing were engaged in, and altogether a most enjoyable evening was spent.

Messrs. W. and D. Downey, of Ebury Street.—Messrs. W. and D. Downey gave a dinner to their employées on Saturday evening. About thirty-three sat down, at 6 p.m., to a well-served table. Several toasts were drank, after which dancing was the order of the day.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. Piper & Carter, *"Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. Piper & Carter, *and crossed "Union Bank, Photographic News Co. Account."*

*** We regret that pressure on our space compels the postponement of "At Home and "Topic."

Countryman.—1. A slight deposit occurs sometimes from the presence of traces of lime in the water. Gentle friction with a tuft of cotton-wool, followed by a copious rinsing with water, will prove a satisfactory remedy. If preferred, treatment with a very weak acetic acid bath may be resorted to. 2. It is the real developing agent. If too little, the solution will not be sufficiently active; and if too much, a deposition of solid matter is likely to occur.

T. C. (Pangbourne).—1. The result is admirable, and an excellent enlargement might be made from the negative. 2. It is surprising how far one may over-expose without serious mischief, provided that proper precautions are taken in development.

J. R. P.—The violet or purple deposit consists of metallic gold, and its separation corresponds to proportionate diminution in the toning properties of the solution.

A. L. Riley.—It is to be feared that the case is hopeless, but the greatest chance of success rests in a prolonged treatment with a dilute solution of potassium cyanide.

Arctus.—1. The second method to which you refer is, we believe, the best known; and the special difficulty you mention may be reduced to a minimum by the exercise of intelligent care. Such points as an equal distribution of the acid solution, and the effective protection of the prepared paper, should suggest themselves to you. In piling the sheets for storage, it would obviously be desirable to place face in contact with face, and back with back. 2. Fume with ammonia before use.

H. Howell.—The print is a very bad lithograph; and the circumstance that the border lines are far from parallel would lead us to suppose that it has been reproduced from an original drawing or engraving by a careless photographer. See our "By-the-Bye" in last week's Photographic News.

W. S. F. (Stockton-on-Tees).—Although not likely to be so useful as a more perfect and complete apparatus, very good results, both as regards landscape and portrait work, may be produced by it provided that dry plates are used.

Harriet Jones.—You will derive much information from Mr. G. Croughton's article, which appeared in our issue for Oct. 2, 1881.

Barium.—The mischief would be reduced to an almost imperceptible minimium if thin and good glass were used; but naturally, blebs and defects would produce corresponding markings.

Rory.—You are wrong, for all that. We have the best means of knowing that Robinson's pictures this year are not combinations. In some cases the skies are printed from separate negatives, but the figures were taken with the landscape.

S. B. Osgood.—Increase the proportion of nitrate of silver; one-fourth more than you have been using would probably prove satisfactory.

One in a Difficulty.—1. The markings appear to be due to the use of imperfectly cleaned or old glasses. 2. A weak bath will answer your purpose best, and it may be necessary for you to add rather less iodiser to the collodion.

Midland.—Interesting, but hardly suitable for our pages.

A Constant Subscriber.—Your bath is doubtless contaminated with an organic poison, and you had better make a fresh solution. It may somewhat mend matters to increase the proportion of acetic acid in the developer.

Enquirer.—The light is not nearly so intense as that obtained by the combustion of magnesium, neither does it contain so large a proportion of the actinic rays.

G. F. Martin.—1. We believe that it consists merely of sulphide of calcium in a state of almost chemical purity. 2. No. 3. When the plate has been over-exposed.

Charles.—1. It is extremely improbable that anyone is now practising the process commercially. 2. Not at present. 3. About eighty-four pounds.

Ambitious.—Unless you can obtain the advice of someone able to judge of its quality, you had better buy a new instrument from an optician of repute.

B. M. J.—Pure silver should be used, the ordinary standard alloy being acted on to a certain extent.

F. Peak.—A temperature of 100° Centigrade is hardly sufficient. You had better use a chloride of calcium bath or an oil bath, and work at about 106° C.

S. M. B.—It has become so much decomposed as to be entirely useless for the preparation of collodion.

In a Difficulty.—The explanation is very simple. You have allowed fumes of ammonia to contaminate the air of your dark-room. If, however, you make your nitrate bath decidedly acid, a moderate exposure to ammoniacal fumes will work no mischief.'

T. Smith.—There is no alternative but to re-polish the lenses, and you had better let the maker perform the operation, unless you are prepared to run the risk of spoiling the instrument.

Dundee.—1. Thank you for the suggestion. 2. In the early part of our next volume. 3. After cleaning in the ordinary way, rub the glass well with a soft cloth on which powdered French chalk has been dusted.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1215.—December 16, 1881.

CONTENTS.

	PAGE
The Effects of Change of Temperature on Photographic Lenses	589
Quinone and Hydro-Quinone	590
At Home.—Herr Lœwy in Vienna: The Lightdruck Process in Detail	590
The Chemical Action of Light. By Dr. J. M. Eder	591
French Correspondence. By Leon Vidal	593
Notes	594
Topics of the Day.—Cheap and Effective Finished Enlargements. By G. Croughton	595
A New Photo-Chemical Light. By John Y. M'Lellan	596
Correspondence	596
Proceedings of Societies	599
Talk in the Studio	600
To Correspondents	600

THE EFFECTS OF CHANGE OF TEMPERATURE ON PHOTOGRAPHIC LENSES.

The above subject is one which was discussed at considerable length at a recent "Thursday evening" meeting. It was stated by one of those present that he had, in more cases than one, observed a distinct change in the defining power of a lens on the temperature changing, and this when special precaution was taken to prevent the deposit of moisture on the glasses. Several other gentlemen corroborated this statement, and a very interesting discussion took place as to the probable cause of the phenomenon.

It was contended by some that the change was brought about by the alteration of the density of the air between the lenses, and not by a change in the glass. The general opinion, however, seemed to be that the change was probably in the latter. It was pointed out, as a likely explanation, that the lenses might have been screwed or burnished into their mounts when the weather was warm, and that the contraction of the brass on cooling might distort the lens. This certainly it would do. We are accustomed to look upon glass as a perfectly rigid substance, but it is very far from that; it is, in truth, one of the most perfectly elastic of substances, and a very slight pressure, especially on the thin edge of a lens of large diameter, might distort it sufficiently to perceptibly alter its defining power. We know, however, that our best lens-makers are very careful not to screw up their lenses so tightly that any such distortion of the glass is likely to occur.

It was given as another possible explanation that the mere expansion of the glass might produce the effect spoken of. This seems unlikely, as the expansion of glass in changing its temperature is very small, and, moreover, the expansion would be proportionate throughout the lens.

We would throw out the following as a likely solution of the difficulty. The amount of expansion produced by a given increase of temperature varies somewhat in different kinds of glass, and we believe that this variation in the case of two lenses cemented together, as in the front combination of a portrait lens, might bring about such an amount of distortion as to appreciably affect the working of the instrument. The change of form brought about by the differential expansions of two substances is one which may be made very apparent in the case of thin sheets of different metals, the expansion of most metals, when changing temperature, being much greater than that of glass. If, for example, two thin strips, one of brass, the other of platinum, be soldered together, and be straight at a certain temperature, they will assume, on becoming either warmer or colder, a curved form, the convexity being on the brass side in the case of increase of temperature. A very sensitive thermometer may thus be constructed. The principle is, as is well known, taken advantage of for compensating clocks and watches to prevent them from going slow in warm, or fast in cold, weather. In the case of the watch, the rim of the balance-wheel is slit at two places, and is made of strips of platinum and brass, the brass being to the outside. In this case the warping inwards of the halves of the rim of the balance-wheel compensates for the increase in length of its arms on the weather becoming warmer.

We have no doubt that a similar action to that of the two strips of metal soldered together will take place in the case of two lenses, one of flint and the other of crown glass, when they are cemented together, and when the temperature changes. The alteration in form will undoubtedly be very small. The total expansion of glass is trifling compared to that of metal, and, moreover, the proportionate difference of expansion is very much less in the case of different kinds of glass than in the case of different metals; besides which, the form of a lens composed of two glasses cemented together is one much less liable to alter than that of a narrow strip which we took as an example in the case of metals. Nevertheless, it is certain that a slight distortion of the shape of the lens may be due to the cause we have mentioned. We believe, however, that a greater change in the working of the combination is likely to take place on account of the state of strain into which the glass will be thrown, than on account of actual change in the form or size of the glass. It is well known that the effect of pressure on glass or any other transparent medium is to change in a remarkable degree its refracting properties, and the state of strain into which a combination of glasses cemented together would be brought on a change of temperature would be equivalent to considerable, possibly great pressure. It must be remembered that in the case of a large aperture lens, a very small change in form or density will produce a marked effect.

It may be asked why, if this be the explanation of the phenomenon, does it seem to make its appearance only in the case of portrait lenses, and not in the case of rectilinear or of the modern form of single lenses, which have each two cemented joints?

The explanation is to be found in the fact that the portrait lens is the only one in which a slight change of form or density will make any marked effect. The change, whether it were brought about by distortion of the glass itself, as just explained, or by pressure of the brass mount, would be equivalent to the introduction of a certain amount of spherical aberration, or rather, as no lens is entirely without spherical aberration, to the increase of that which exists. The portrait lens is the only one in which it is necessary to reduce spherical aberration by the form of the lens itself. In the single lens, for example, a very large amount of spherical aberration exists when it is used full aperture, so much that any additional which might arise from slight distortion of the lens would be quite unobservable, and in this case the defect is got rid of by considerably reducing the aperture.

◆

QUINONE AND HYDRO-QUINONE.

Now that hydro-quinone is occasionally pressed into service as a reducing agent wherewith to bring out the latent image on bromide of silver, a short account of the chemistry of this remarkable body may prove of interest to our readers.

Hydro-quinone differs from pyrogallic acid by containing one combining proportion of oxygen less; the formula of pyrogallic acid being $C_6H_6O_3$, and that of hydro-quinone, $C_6H_6O_2$. Like pyrogallic acid, hydro-quinone is a powerful reducing agent, and in the presence of an excess of alkali the oxidation proceeds so far as to give rise to the production of brown ulmic products like those produced from pyrogallic acid under similar circumstances.

A substance of considerable scientific interest called quinone, kinone, or chinone, may be regarded as the immediate parent of hydro-quinone, hydro-kinone, or hydrochinone; and this parent compound, which contains $C_6H_4O_2$, may be readily obtained by distilling a mixture of one part of quinic acid, four parts of manganese dioxide, and one part of sulphuric acid; this latter being previously diluted with half its weight of water. A very gentle heat being now applied, dense white vapours pass over into the receiver, and these condense into beautiful shining yellow spangles of quinone. By the action of suitable hydrogenizing agents, such as an aqueous solution of sulphurous acid or of hydriodic acid, the quinone is readily converted into hydro-quinone, which may then be obtained in colourless transparent rhombic crystals by evaporating the solution. Intermediate between quinone and ordinary, or colourless, hydro-quinone there stands a remarkable green body containing $C_6H_6O_2 . C_6H_4O_2$; and this intermediate body may be formed by cautiously hydrogenising quinone, the slow oxidation of hydro-quinone, or the direct union of quinone and hydro-quinone.

By reference to the price list of Messrs. Hopkin and Williams for the present month, we see that hydro-quinone is quoted at 10s. per ounce, this being a notable reduction on the price which would have been charged some years ago. We may, however, hope that a moderate demand for the article may bring about such a lowering of the price as to make hydro-quinone development as cheap as, or perhaps cheaper than, pyrogallic development; especially as Nietzki has recently published details of a method by which quinone may be economically and easily prepared by the oxidation of aniline.

For this purpose a cold mixture of one part of aniline, eight of sulphuric acid, and thirty of water, is treated with powdered bichromate of potassium, until the dark precipitate which first forms is re-dissolved, about two and a-half parts of the bichromate being required in ordinary cases. The mixture is now allowed to stand at rest for about twelve hours, after which it is agitated with ether, this solvent dissolving out the quinone, and carrying it to the surface. It is now merely necessary to evaporate the ethereal solution in order to obtain the quinone in a crystalline state.

We have ourselves tried the above-described process of Nietzki, and find it to be easy, and the yield abundant. No difficulty need now stand in the way of manufacturing hydro-quinone at a price of between one and two shillings per ounce.

At Home.

HERR LÖWY IN VIENNA—THE LICHTDRUCK PROCESS IN DETAIL.

Lichtdruck is German by name and German by nature; that is to say, it is among German-speaking people that the process is carried out to perfection and upon a large scale. Munich counts three large Lichtdruck establishments at least—those of Herrn Albert, Bruckmann, and Obnernetter; Vienna has certainly as many; while in Berlin, Dresden, Frankfort, Mayence, Hamburg, and elsewhere, first-class Lichtdruck firms are to be found.

Herr Löwy's studio at Vienna is one of the most complete photographic establishments we have met with, since it combines the taking of high-class portrait negatives with silver and mechanical printing. We should much like to describe the portrait-taking branch of the establishment, as well as the more industrial; but, in the first place, we have not the space at our disposal; and secondly, by reason, as it was explained to us, of an "unruhiges Frauen-zimmer" in the glass-room, we could do no more than take a hasty glance at that part of the building. We must be content for the present to bear testimony to the charming bust portraits of Viennese ladies for which Herr Löwy has recently become well-nigh as famous as Luckardt, and pass on to the Lichtdruck rooms; for a full description of the process as it is practised at the present day cannot fail to be interesting to our readers.

In Herr Löwy's compact establishment there is a *personnel* of no less than forty, of which the greater number are employed upon Lichtdruck. There is both the Schnell-press (quick-press) and hand-press here, for Herr Löwy does work of all sorts, from the finest to the roughest. It is rather a warm atmosphere into which we are first introduced, an apartment not very roomy and not very light, and here we are initiated into the first stage of the process.

Here is a sheet of glass. It is very thick, apparently a quarter of an-inch, and it is to be made into a printing block. The glass has been cleaned, and is now ready to receive the preliminary coating. The solution must be used *fresh*, and is prepared of—

Soluble glass	3 parts
White of egg	7 ,,
Water	9 to 10 ,,

The soluble glass must be free from caustic potash. The mixture is filtered and made use of the same day, being applied to the glass as evenly as possible. The superfluous liquid is poured off, and the film dried either spontaneously, or by slightly warming. The film is generally dry in a few minutes, when it is rinsed with water, bearing an open, porous surface that is said to be slightly opalescent. We are bound to say, however, that this opalescence is so slight as to be scarcely visible to our inexperienced eyes.

Many of these plates (the surface now perfectly dry) are here ready for further treatment. They stand upon a slate slab, which is warm, for underneath is a water-bath. Herr Furkl, the skilful manager of this department, is one of the most experienced of Lichtdruck photographers, and he sees at a glance the quality of a prepared plate without any practical testing. "Now, this is a good preliminary film," he says; it is a glass that is transparent, and yet slightly dull. The film is so thin, you can scarcely believe it is there.

We now come to the second stage of the process—the application of a film of bichromated gelatine to the plate. This is the formula generally used:—

Bichromate of potash	15 grammes
Gelatine	2½ ounces
Water	20 to 22 ,,

According to the weather, the amount of water is varied; but, in any case, the solution is a very fluid one. An ounce is about 35 grammes, as our readers know.

The bichromated gelatine is poured upon the plate (it makes a very thin film), and the glass then put into the drying-chamber. Much depends upon the drying. A water-bath with gas-burner is used for heating, and a slate slab, perfectly level, receives the glass plate. The drying-chamber is kept at an even temperature of 50° C. The object to be attained is a fine grain throughout the surface of the gelatine, and unless this grain is satisfactory, the finished printing-block never will be. If the gelatine film is too thick, then the grain will be coarse; or, again, if the temperature in drying be too high, there will be *no grain at all.* The drying is complete in two or three hours, and should not take longer.

The film is now ready for printing under a negative, and this is done in an ordinary printing-frame. The sensitive film being upon the surface of a thick glass plate, it is necessary that the cliché or negative employed should be upon patent plate, or not upon glass at all, so as to ensure perfect contact. Best of all is it to employ a stripped negative, in which case absolute contact is ensured in printing. It is only in these circumstances that the most perfect impression can be secured.

The exposure is very rapid. Any one accustomed to photo-lithographic work will understand this. At any rate, every photographer knows that bichromated gelatine is much more sensitive than the chloride of silver he generally has to do with. There is no other way of measuring the exposure than by photometer or personal experience, and the latter, we are assured, is by far the best method.

The impression is taken from the pressure-frame, and put into cold water. Here it remains for half-an-hour or an hour, according to discretion. The purpose is, of course, to permit the soluble bichromate to wash out. It is when the print comes out of this bath that judgment is passed upon it. An experienced eye tells at once what it is fit for. If it is yellow, the yellowness must be of the slightest: indeed, Herr Furkl will not admit that a good plate is yellow at all. A yellow tint means that it will take up too much ink when the roller is passed over it.

The washed and dried plate should appear like a design of ground and polished glass. The ground-glass appearance is given by the grain. If there are pure lights (almost transparent) and opalescent shadows, the plate is a good one.

We have now a printing-block ready for the press. If it is to be printed by machinery (that is to say, in a *Schnell-press*), the surface is etched; if it is to be more carefully handled in a hand-press, etching is rarely resorted to, and it is moistened only with glycerine and water.

Here is a plate about to be etched. It is placed upon a levelling-stand, and the etching fluid poured upon it. The formula is—

Glycerine	150 parts
Ammonia	50 ,,
Nitrate of potash (saltpetre)	5 ,,
Water	25 ,,

Another equally good formula, which is recommended by Allgeyer, who managed Herr Albert's Lichtdruck printing for some years, is—

Glycerine	500 parts
Water	500 ,,
Chloride of sodium (common salt) ...	15 ,,

In lieu of common salt, 15 parts of hyposulphite of soda or other hygroscopic salt, such as chloride of calcium, may be employed.

The etching fluid is permited to remain upon the image for half an hour. Herr Furkl invites us to touch the plate, and by gently moving the finger to and fro over the surface, we distinctly feel the swelling or relief of the image. The plate is *not washed* afterwards, but the etching fluid simply poured off, so that the printing block remains impregnated with glycerine and water; at the most, a piece of bibulous paper is used to absorb any superfluous quantity of the etching fluid. After etching, the block goes straight to the printing press.

The inking up and printing are done very much as in lithography. If it requires a practised hand to produce a good lithographic print, it stands to reason that in dealing with a gelatine printing block, instead of a stone, skill and practice are more necessary still. Therefore, at this point the photographer should hand over the work to the lithographer, or rather the Lichtdruck-printer. It is only by coaxing judiciously with roller and sponge that a good printing block can be obtained, and no amount of teaching theoretically can beget a good printer. To appreciate how skilful a printer must be, it is only necessary, indeed, to see the imperfect proofs that first result, and to watch how these are gradually improved by dint of rolling, rubbing, etching, cleaning, &c.

In all Lichtdruck establishments, two kinds of ink rollers are employed, viz., of leather and of glue. In some establishments, too, they employ two kinds of ink, but Herr Löwy manages to secure delicacy and vigour at the same time in an impression by employing one ink, but rolling up with two kinds of the roller.

Lichtdruck prints, and portraits particularly, are usually varnished; they are first coated with a dilute solution of gelatine to act as sizing, and then a spirit varnish applied. If the varnish were applied before the print is sized, the varnish would pass through the paper.

We have already described the *Schnell-press* in action in our "At Home" with Herr Albert, and we propose to say something about hand-presses when we come to describe Herr Obernetter's well-known establishment at Munich.

The "Bye-the-Bye" next week will be "On Finishing Carte Pictures"; the following "At Home" will be "Herr. Schaarwächter at Berlin."

◆

THE CHEMICAL ACTION OF LIGHT.

BY DR. J. M. EDER.

Light causes many chemical changes, molecular alterations, combinations, and dissociations, which we may include under the term "photo-chemical reactions." Those rays of the solar spectrum which are most active in effecting these reactions are often called the "actinic rays," and the chemical action of light is termed "actinism." Since the majority of substances experimented on are most susceptible of the influence of the rays at the violet end of the spectrum, the more refrangible rays are generally called (on Wollaston's principle) chemically active or actinic rays. There is, however, no colour of the spectrum which produces absolutely no effect in the silver salts; there are some substances which are actually more sensitive to red than to violet light. For this reason the theory propounded by Richter in 1801, and supported by Davy in 1812, that the light of the more refrangible portion produces reduction, and that of the less refrangible part oxidation, cannot be maintained.

Chemically actinic rays exhibit also the phenomena of interference, refraction, and polarisation. Polarised light causes chemical reaction, in which, as Draper showed, the direction of vibration has no influence. Sutherland discovered that purple red light is more active in polarisation effects than yellow, but that the violet and green rays are equally effective. In 1855 Duboscq produced photographs of the phenomena of light polarised by means of quartz.

Only those rays which are absorbed by any particular body can effect a chemical change in that body. The observation of the law—that whenever a chemical change is produced in a body by light, rays of a particular degree of refraction are absorbed, and that without absorption no photo-chemical change is possible—is due to Draper. During a photo-chemical process light is absorbed, and that to a greater extent than if the light were to pass through the substance without causing any change; there is, therefore, a difference between the chemical and the optical absorption of light. Bunsen and Roscoe determined very accurately in this way the absorption coefficient of the explosive mixture of chlorine and hydrogen. Light which has passed through chlorine and hydrogen, through a solution of ammonio-ferrous citrate, through a mixture of ferrous-chloride and oxalic acid, or through one of chloride of mercury and oxalate of ammonia, will not produce a second time any chemical action on the same substance.

H. W. Vogel maintains that not only the absorption of the sensitive body itself, but also that of other bodies mixed with it, had considerable influence in determining the chemical effect of light. Bromide, iodide, and chloride of silver, stained with various dye stuffs, are rendered sensitive to those rays of the spectrum which are optically absorbed by the particular colour, and by this means it becomes possible to make these salts of silver sensitive to the yellow and red rays of the spectrum, which have hitherto been considered as photographically inactive. These dyes Vogel calls optical sensitizers. All dye stuffs, however, do not exhibit this effect, and with other sensitive substances—ammonio-ferrous oxalate, potassium bichromate, uranium nitrate, potassium fericyanide—no such effect of the so-called optical sensitizers can be recognized.

Alterations in Molecular State Produced by Light.—White phosphorus turns red in the sunlight, whether under water, alcohol, ether, olive-oil, oil of turpentine, or mineral oil, or in vacuo, in hydrogen, or in nitrogen; the change to amorphous phosphorus takes place even in diffused light, and at a temperature of—14° C. According to Draper, it is the more highly refrangible rays which produce these changes. Light acts in the same way on phosphorus dissolved in bisulphide of carbon, and during the action the rays from H up to the ultra-violet are absorbed. Sulphur, melted at a temperature of 130° C., and exposed to the light of the sun, becomes covered on the surface with sulphur, which is not soluble in carbon disulphide, but this reaction will not occur if the substance be kept in the dark; on the other hand, solid sulphur undergoes no change in the sunlight (Berthelot). Lallemand and Berthelot found that a concentrated solution of carbon disulphide, when exposed to the sunshine in an hermetically sealed glass tube, deposits insoluble sulphur, and that the light which has passed through the solution is deprived of all the rays above G.

Finely sub-divided amorphous selenium exposed to the direct rays of the sun is gradually converted into the crystalline state. Crystalline selenium is a better conductor of electricity when exposed to the light, than in the dark. On this property depends the principle of the selenium photometer and the photophone. May discovered that the action of light increases the conducting power of selenium, and Siemens showed that thin plates of this substance, first heated to 200° C., and then cooled, are exceedingly sensitive to light; Graham Bell turned this discovery to account in his photophone, which he brought out in 1878.

The following is the construction of Bell's instrument. A telephone and a thin lamina of crystalline selenium are inserted in the circuit of a galvanic battery. If, now, the lamina is alternately illuminated and darkened, the electrical resistance of the selenium varies with each change, and, corresponding to this variation, a note is heard in the telephone, the number of the vibrations to produce which is the same as the number of alternations of light and dark in a second. For producing the illumination a thin mirror of silvered glass is used, from which parallel rays of sunlight are reflected into the selenium, at a distance from it of 250 metres and more. If, now, a person speaks against the reverse side of this mirror, the vibrations produced by his voice alters its shape, so that it becomes sometimes more convex, and then, again, more concave. Corresponding to the alteration, the reflected rays of light are dispersed over surfaces of varying size, and consequently the intensity of the illumination of the selenium changes periodically, so that a tone is produced in the telephone.

It is maintained by Draper that chlorine gas is so far modified by insolation, that it will afterwards unite with hydrogen in the dark; but this is controverted by Roscoe, Becquerel, and Frey. According to Favre and Silbermann, chlorine gas, when absorbed by a solution of potash, after being exposed to light, gives off 478·85 units of heat, whereas, when not exposed, it gives off only 439.70 units. The assumption of Budde and Melloni that the molecule of chlorine is split into atoms by the action of light was afterwards recalled by the former.

Cinnabar blackens in the light by the conversion of the red crystalline mercury sulphide into the black amorphous form of the salt. This change is effected more quickly with cinnabar prepared in the wet way than by sublimation; when the salt is placed in an alkaline solution it blackens very rapidly, more slowly in water, and in nitric acid no change takes place. Mercury and sulphur confined in sealed glass tubes combine to form the red sulphide of the metal under the action of the light, but when the light is excluded, the black sulphide is formed. Native arsenic disulphide (realgar) is red and translucent; but exposed to the sunlight it becomes opaque, and gets coated with a yellow crust. Red antimony ore is also said to turn opaque, more especially in those parts on which the light falls. The mineral zircon, when acted upon by light, loses both its brilliancy and its colour.

Faraday, in 1823, followed by Splittberger, in 1839, and by Gaffield, in 1863, observed that every kind of colourless glass becomes coloured in the light, turning more or less yellow, green, violet, purple, &c.; the latter of these observers states that window glass, after an exposure for a year, will show this change, and that the tint becomes darker by continued exposure. There is, in fact, no kind of glass which is able to resist the action of the sun's rays for any length of time, though colourless potash glass, or artificially coloured glass (such as blue glass), is the most permanent. Bontemps, Pelouze, and Peligot have also investigated this subject. Glass containing gold and copper is colourless, if rapidly cooled after leaving the furnace, but turns ruby red after long exposure to the light; exactly the same thing happens by heating the substance a second time to the point at which it becomes soft, and in neither of these cases is there any chemical change in the composition of the glass.

Crystals of silver iodide, obtained by evaporation from a solution of the salt in hydriodic acid, do not change colour in the light, but crumble quickly to powder. Silver bromide and chloride in the crystalline state also alter their structure; under the action of light they turn dull, and lose their brilliancy. To produce these mechanical changes in the silver salts, the first action of the light must be very powerful; they are most readily obtained when by the addition of certain other substances the sensitiveness of the salts has been destroyed or reduced. A plate of silver fumed with iodine undergoes a considerable change of structure under the influence of light, as before exposure the film of silver iodide resists a tolerably hard rubbing, but after exposure it is easily rubbed off; an iodised glass mirror behaves in the same way.

Vinylic bromide gives polymeric compounds under the action of light. The photenes and phosenes, dissolved in benzol, are converted without any alteration of composition into paraphotenes and paraphosenes; but by melting, the latter are re-converted into their original state.

The right rhombic prisms of nickel sulphate are converted, when exposed to sunlight, into small regular octohedra aggregated together in the form of the original crystal; according to Mitscherlich, the crystals of zinc selenate also alter their crystalline form in the sun. With regard to the influence of light upon the process of crystallisation, Petit observed, so far back as 1722, that a solution of saltpetre and sal-ammoniac gave a finer growth of crystals in the sunshine than in the shade, and in 1788 Chaptal found that the crystals of the metallic salts are formed more rapidly on the side which is turned to the light. Dorthes also, in 1790, remarked that camphor enclosed in sealed flasks sublimes more especially on the side of the flask which is turned towards the light; iodine and the vapour of water behave in a similar way. In certain methods of glass silvering, as observed by Carey Lea, the sun's co-operation is necessary.

(*To be continued.*)

FRENCH CORRESPONDENCE.

Meeting of the Photographic Society of France—Improved Process of Photo-Engraving—New Dark Slide Impervious to Light—Various Descriptions of Lanterns

Meeting of the Photographic Society of France.—The last meeting of the Photographic Society was a great success; it was more numerously attended than on any previous occasion, a proof of the great interest which is taken at the present time in all photographic improvements. Among the visitors we noticed Mr. Mansfield, who is well known in the photographic world, more especially in England. Photography appears to be receiving a fresh access of vitality, which may be attributed to the great extension of the gelatine processes; and one of the evidences of this fact is the number of communications read at the meeting on the different accessories necessary for carrying on these processes, such as instantaneous shutters, studio lanterns, and light and flexible supports. These are now the principal subjects of discussion at the meetings of all our photographic societies, and they also form the staple matter of the special journals.

Improved Process of Photo-Engraving.—Notwithstanding the invasion of our art by gelatino-bromide, photo-engraving is not losing ground; a very interesting paper on this important application of photography was read by Mr. Gobert, of the Bank of France. Mr. Gobert's process is an improvement on the one invented by a Russian gentleman, M. Stroubinsky, which I have already brought to the notice of my readers; the modification introduced by M. Gobert has had the effect of rendering the original process very simple and practical. Let me commence by pointing out that this process of photo-engraving is adapted to the reproduction of line drawings, so as to engrave them either in copper-plate or in relief. A plate of copper is coated on the turning table with a very thin layer of bichromatised albumen, and it is then placed on an iron plate and heated to about 40°C. When it is dry, it is exposed to the light beneath a positive print of a line drawing. The exposure must be very short, as the bichromatised film is tolerably sensitive; after exposure the plate is dipped in water, which dissolves all the albumen that has not been altered by light. So thin is the film that the image is scarcely perceptible, and in order to see how the development progresses, and whether the image is in a condition to allow of the engraving being finished, a very ingenious artifice is resorted to. This consists in plunging the plate into a concentrated solution of aniline red, which adheres to all the insoluble albumen, and colours it. The image then appears of a deep red colour, and its state of development can be easily observed. If it has arrived at the proper point, it is dried, and then etched. But before commencing the etching, it is necessary to coat all the parts of the plate to be preserved from the action of the acid with a protecting varnish consisting of a solution of bitumen in benzine. When the varnish is dry, the surface of the plate is covered with a solution of perchloride of iron in alcohol. This solution not only attacks the copper, but has the effect also of coagulating still further the image in the bichromatized albumen, since both alcohol and the iron salt act as coagulators. We are therefore certain that no injurious action can penetrate below the image. After sufficient etching, the plate must be rubbed vigorously with a damp cloth covered with whiting or with tripoli powder, or with emery polish, in order to remove all the albumen and varnish. It will be seen that this process is extremely simple, and it offers the additional advantage of being very quick, since the whole operation can be completed in a few minutes. When the engraving is to be in relief, a negative must be used instead of a positive. We shall have at first a relief cleanly cut, but not sufficiently raised for typographic impression. We must, therefore, continue the hollowing of the metal, proceeding in the usual way by successive inkings and etchings. The improvement which M. Gobert has effected in this process consists in the employment of bichromatised albumen instead of bichromatised gum, as used by M. Stroubinsky. Since the mucilage does not offer sufficient resistance to the solvent action of water, M. Stroubinsky had devised a plan of coating the bichromatized film after exposure with a thin layer of bitumen; he then plunged the plate into water, which, as it had to act through the bitumen, took a long time in producing the required effect. It will be seen how greatly the substitution of albumen for gum simplifies the process, and shortens the length of the operation, at the same time that it renders it more secure. For my own part, I cannot see why, in the majority of cases where bitumen is used, it would not be preferable to have recourse to bichromatized albumen; this would have the effect of rendering the duration of the exposure very short, especially in winter. The first etching bath would be one of a solution of perchloride of iron in alcohol, and then the operation could be carried on in the usual way when plates are taken for typographic impression. M. Robert, who is in the service of the War Department, has used for several years a layer of bichromatized albumen for taking photographic images on zinc. There is therefore nothing new in all this, although we have as the result a charming engraving process, easy to execute, and capable of rendering excellent service both to printers and engravers.

New Dark Slide, Impervious to Light.—M. Gilles, a skilful maker of photographic apparatus, has successfully solved a problem which has presented itself ever since extra-sensitive films came into use; that is, the production of a slide absolutely protected from the penetration of light. His slide is double; it is furnished with two curtains, of which the one in opening passes over the other, which remains closed, so that when a plate is exposed, there are behind the slide two screens one over the other. After the plate is exposed, the curtain which is to cover it is drawn, the slide is turned round on the opposite side, and the second curtain is drawn back. By this means there is nowhere an opening at any part of the frame. In my opinion it forms the best means of security in travelling, especially where one is liable, when the slide is open at the top, to be plagued with spots caused by the light penetrating between the shutter and the opening in which it slides.

Various Descriptions of Lanterns.—There were also several lanterns exhibited at the meeting. One shown by M. Gilles is glazed on one side with ground yellow glass, and this is again covered with an opaque shutter. After the plate has been dipped in the developing bath, the operator using this lantern opens the shutter, and is thus able to follow the development of the image in a clearer light than he would be able to do if the lantern were entirely glazed with red glass. This arrangement seems to be a very good one.

Leon Vidal.

Notes.

The Year-Book of Photography and Photographic News Almanac for 1882 will be published on Tuesday next, the 20th inst.

The Electric Exhibition at the Crystal Palace will not be perfected till January, but the Palace is to be illuminated by electricity in Christmas week.

Dr. J. M. Eder commences this week a series of articles on the chemical action of light.

In these days of fog and darkness, it is well to have a good plan of preserving sensitized paper fresh and white during a spell of bad weather. For ourselves, we still hold to the old-fashioned plan of employing bibulous paper saturated with carbonate of soda solution, and dried. If a sheet of soda paper is put away between pairs of sensitized sheets of albumenized paper—being placed face to face—the latter will keep very well in a dry place for ten days or a fortnight.

Mr. Maxwell Lyte—whom photographers will gladly welcome back to this country—made some interesting observations on Tuesday night at the meeting of the Photographic Society, concerning certain actinic experiments he had undertaken during his sojourn in the Pyrenees. In connection with his meteorological work, it was necessary for him to employ a sensitive surface on the constancy of which he could rely; and after repeated experiment he found that pure chloride of silver gave the only trustworthy film. This, Mr. Lyte believed, was the sole compound known to photographers whose uniform sensitiveness could be relied upon.

In the course of his interesting paper on halation, on Tuesday night, Captain Abney remarked upon the uselessness of employing wet blotting-paper behind a collodion plate to prevent blurring. Wet blotting-paper may be useless to stop halation—we do not remember, by the way, to have heard it advocated for the purpose—but its use is undoubted for preserving a collodion plate in a damp condition during a long exposure. By this simple plan we have frequently kept a collodion plate moist in the dark-slide on a summer's day for an hour or more.

Captain Abney's advocacy of asphalte as a suitable material for backing plates adds one important testimony the more to the efficacy of that material, which our readers may remember we strongly recommended in these columns in July of last year. Liquid jet, which is manufactured by Messrs. Hopkin and Williams, and is apparently a strong solution of bitumen in benzole, dries almost instantly, leaving a deep orange film on the glass. This, too, may be easily removed after development by scraping with a knife. Dr. Fol, it may be remembered, insisted on the necessity of backing with a substance having a high refractive index, and he uses carbon tissue softened in glycerine.

Herr Fritz Luckardt kindly sends us from Vienna some charming examples of a new style of portrait, which has the advantage of being striking and novel, while it is very easily produced. He details his *modus operandi* in the forthcoming Year-Book, but it may be explained in two words. He photographs the model against a perfectly white background, and then upon the negative, by means of a needle, puts in a little tasteful shading around the figure. It is necessary to have a suitable varnish; but the composition of this he also gives in the Year-Book.

Fritz Luckardt has always been commended for the masterly way in which he can handle drapery, and these studies show that he is still *facile princeps* in the art of draping and posing. White satin and black satin he secures with all their lovely gloss and sheen, while a delicate robe of white silk, with its translucent folds and rich harmonies, is represented as if by a skilful painter—clear and bright to the very margin of the picture. Here is a dress of white satin edged with snowy fur, the lady's ornaments being a girdle of pearls and a bead necklace. Only silvery high-lights and clear grey shadows are there; but so delightfully controlled, that the absence of massive contrast never once asserts itself.

Just another paragraph to describe a bewitching pose. A statuette of Cupid stands upon a pedestal, at the base of which are growing ferns. A lady—of course, in a shining white robe—rests one hand on the top of the pedestal, while in the other she carries a closed fan. Her head is thrown back, and playfully turned towards the little god of love, her arch look and uplifted fan still further denoting the coquette.

The other day we were present at a lecture which was illustrated by a number of photographic transparencies of line diagrams taken from technical books; but before the proceedings commenced, the lecturer regretted to say he would have to show one diagram as a negative, as he had not found time to make a transparency from it. The bright lines, however, showed so much more distinctly and boldly on the screen than the dark lines of the transparency, that our friend expressed his intention of always using *negatives* of diagrams in future.

The same ingenious Yankee who announced an electric light for eighteenpence some time ago, now brings forward a gem photographic camera for twelve stamps. Like the light aforesaid, the camera is made to *sell*, and it certainly fulfils this object. The idea is to produce the magic photographs, with which our readers are familiar. These, as everybody knows, are simply untoned prints placed in a solution of bichloride of mercury to bleach; then, to render the picture visible at any time it is only necessary to place it face to face with paper that has been soaked in hyposulphite solution, the two surfaces being moistened with water.

Topics of the Day.

CHEAP AND EFFECTIVE FINISHED ENLARGEMENTS.

BY O. CROUGHTON.

Certainly the most effective of all cheap coloured enlargements are those tinted (for it cannot be called painted) with oil colours, if done with judgment and taste, and not overdone with positive colours like the majority of the cheap club work. There is no reason why these should not be tinted with quiet taste, instead of being, as is too often the case, mere gaudy daubs, without taste or harmony. These can either be vignettes or solid; I prefer the latter with a background of medium tint, neither too dark nor too light. With a background of this description you can bear to bring out every gradation of the face, and so save work in the tinting; at the same time the lights must be pure and clear.

Now for the colours and materials required. Set your palette in the following order. A satinwood palette is best, as you can see the tints better upon the light satinwood than upon the mahogany. Naples yellow No. 1, yellow ochre, light red, Indian red, vermilion, madder lake, cobalt blue, emerald green, Payne's grey, blue-black, Cologne earth, burnt umber, raw umber, burnt sienna, raw sienna, flake white, macgilp. You can either use the macgilp as sold in tubes, or make it yourself. If you make it yourself, you can regulate its drying. Half copal varnish and half-light drying oil will make a good general medium. If you wish it to dry quicker, use more varnish; if slower, more oil.

The first thing to do is to put in the background; if a vignette, cobalt-blue, light red, and white will form a good general tint, which must be graduated into the white of the vignette, it looks better to put it in the form of clouds. This can be done roughly with a half-inch flat hog hair brush, using different brushes for the tint, the blue, and the white.

The graduating should be done with a badger softener, the tops of the hair being lightly dabbed into the colours, which it will distribute and soften into each other, with an effect almost like stippling; one painting should be sufficient for this. If a solid picture, you can afford to have the colours deeper, using less white, deepening the shadow on the lower part of the background with burnt umber with a little madder brown, deepening the background upon the lighted side of the face, and lightening it where the outline of the shadow side is relieved against the background. This can also be roughly put in, first with the hog hair brushes, and finished with the badger, used as described above. You will have to dab the colour over face and dress, but it is better to wipe the colour off where it is not wanted, than to stop short where it is wanted. Now with a clean linen rag wipe off all colour which may have gone over hair, draperies, &c., and put in with a flat tint the local colour of dress, hair, &c., using plenty of macgilp, and the colours transparent. If dress or coat is black, Payne grey, well diluted with macgilp, will be best for the local tint. Soften and even all flat tints with a long haired-flat sable brush.

Now take one of the half-inch flat sables, and put the flesh tint upon the palette; for fair complexions use madder lake and yellow ochre well diluted with macgilp; if the photograph is dark, you may use a little Naples yellow, No. 1 added, but very little, for it is best that these first tints should be made transparent.

For male complexions use light red and yellow ochre, and for ruddy complexions light red alone; of course, the thinning with macgilp being understood in all cases. The first flesh tint should be laid like the others, with a flat sable, and softened with a clean brush of the same description. Mix some carnation with madder lake, Naples yellow, and a little yellow ochre (more of the latter for male complexions), and lay it where wanted, viz., from the wing of the nostril downwards towards the corner of the mouth, then upwards towards the ear, a little over the lower part of the ear, and round the chin; and in fair complexions upon the shadows, upon the forehead, softened and graduated into the local tint. Now warm up the deeper shades with light red, Indian red, and in some parts vermilion; for instance, the upper lip, if very dark, may want vermilion to brighten it up to the proper colour; if so, the line below the lips may be touched in with Indian red. The nostrils, the deepest shades under the eyebrows, and on the extreme edges of the shaded side of the face, and the shade under the chin, may all be treated with the same colour used thin and transparent, and the edges softened into the half-tints. The under lip must now be put in with madder lake, vermilion, and Naples yellow, shaded with Indian red. The local colour of the eyes should now be put in with a transparent tint of the proper colour, and the reflected light upon the iris put in with body colour; for instance, if the eyes are blue, or blue-grey, pass a flat tint of cobalt all over the eye, deepen the pupil with cologne earth, and put in the reflected light with cobalt-white and a very little light red to temper the positive blue. The high light upon both balls and white may be touched in sharply with the same colour, but with considerably more white. If this is done as described, you will seldom want to touch upon the eyes again. The next thing to attend to is the high lights upon the face. For the forehead use Naples yellow, madder lake, a little yellow ochre, and a little white. Put the high lights on in their proper places, the upper part of the forehead and over the eyebrow, and soften the edges into the flesh tint, being careful to keep the shape of the lights, and not to spread or work the solid colour too much. The same colours, omitting the white, and adding a little light red and emerald green, may now be used to graduate the flesh tint into the shadow on the shaded side of the forehead. Now, working downwards, using only Naples yellow and madder lake, put in the high light upon the cheek-bone, graduating downwards. On the rounding of the cheek, and graduating it into the general tint of that part of the face. Touch in the light on the upper eye-lid, and the light under the eye next the nose which strikes downwards towards the wing of the nostril, mark the line down the nose, and strengthen the light upon the nostril, the upper lip, and upon the chin and neck; the shaded side of the face can be treated in the same manner with the same colours, only adding the light red and emerald green to subdue the brightness of the tints. At this stage the picture must be left to dry, and when dry a few touches will finish it.

When thoroughly dry, charge a large hog-hair brush with macgilp, breathe upon the picture, and, before the moisture has disappeared, rub the macgilp over face, hair, and dress. If the face should not have colour enough, a little of the flesh-tint with the macgilp will make a wonderful improvement; if too pink, a little yellow-ochre; if too yellow, a little pink. A few touches only should be needed upon the face. Perhaps the high-lights want strengthening; the deepest shades deepening or lowering, a few sharp touches about eyes, nose, and mouth; the line between the lips may want strengthening with indian-red and madder-brown; the nostrils can have a touch with the same colour; and the cast shadows of the nose, and the deepest shade under the eyebrows. Any shadows that may be too warm may now be corrected with light red and emerald-green; the deepest shades of the hair may now be strengthened, and high-lights touched in with solid colour. The coat or dress should be treated in the same way, a black coat being strengthened in the shadows with blue-black, carefully keeping to the photographic shadows on both hair and dress. The high-lights in black silk can be touched in with Payne's grey and white, with just a little Cologne earth to subdue the brightness of the Payne grey. White collars, lace, &c., should not be painted in with pure white. Flake white and Naples yellow should be used for high-lights, and cobalt blue, yellow ochre, and white for the shadows.

It will be seen from this brief description that no part of the photograph has been obscured with colour, the only solid colour being in those parts where in the photograph we have white paper, and all the other parts being overlaid with transparent colour, through which the photograph is allowed to show. If this principle is carefully adhered to, losing the likeness is an impossibility.

The "Topic" next week will be "On Working Gelatine Emulsion," by William England.

A NEW PHOTO-CHEMICAL LIGHT.

BY JOHN Y. M'LELLAN.*

In bringing before you this evening the results of some experiments with "A New Photo-Chemical Light," possibly I ought to apologise for the title I have chosen, for when I tell you that the light I propose to produce is the result of burning various substances, simple, compound, and mixtures in oxygen gas, you will naturally enough say that there is nothing new in this, and that such a light has been familiar to you for a great many years: in fact, ever since oxygen gas was discovered by Priestley in the year 1774, the burning of phosphorus in oxygen has been a favourite and striking laboratory experiment to show the great energy with which the gas supports combustion. I trust, then, that you will accept my apologies for presuming so far. But is it not strange that the means of producing one of the most intensely brilliant lights within the compass of chemical science should have lain dormant for upwards of a century without finding any practical application? Well, there are very few, if any, industries or fields of research, to which such a short-lived means of illumination could render any valuable assistance; but since the advent of rapid dry plates in photography, with a possible future in which even greater rapidity than at present exists will be the rule, an actinic light of comparatively short duration may answer all the requirements of the photographers.

It is in the hope, then of being able to render practical such a light, which shall fulfil all the scientific requirements for the time being, and which shall at the same time possess the important functions of cheapness and simplicity, that I am at present devoting my attention. My experiments in the meantime are not sufficiently far forward to warrant my attempting portraiture. I shall therefore content myself this evening with showing you the results of some preliminary experiments, and perhaps may credit myself with proposing "A new application of an old photo-chemical light."

It is well known that all substances which burn in atmospheric air burn with greatly increased energy in oxygen gas; hence we say that oxygen is a powerful supporter of combustion. The fact is taken advantage of in all the pyrotechnic compositions that are prepared for producing artificial light for the luxograph, firework display, and the ship's signals, by mixing in varying proportions some substance rich in oxygen, such as potassium chlorate or nitrate, along with some substance capable of combining with it; and the brilliancy of the light produced seems to be in a direct ratio to the facility with which the one combines with the other. Furthermore, when the ingredients are in the proper proportions, and of the most suitable description, the energy of the combination is so great as to create a heat sufficient to volatilize many metallic bodies, when mixed with the composition, with the result that the light strikes a colour characteristic of the particular element. Thus, if mixed with antimony as one of its compounds, the colour would be blue; if copper, violet or green; and if strontium, the colour would be red. In practice, however, it is found that to produce the best results in any one particular colour some definite salt of the metal is chosen.

My guiding idea, then, has been, seeing that oxygen gas is such a powerful supporter of combustion, why not employ it in its elementary state, and discard all compounds rich in it in a combined state, when there would be no energy created but the energy resulting from combination, nor any loss through dissociation, as is the case with all pyrotechnic compositions, so that the quantities being equal, a very material gain ought to result through the employment of this method. When my experiments are completed I propose to select the light that gives the greatest chemical energy, and to attempt portraiture by its means.

My method of testing the relative energies of the different lights is to expose a Swan's dry plate (20 times) behind an actinometer for a definite length of time at a definite distance from the light, and to develop by some standard developer. The actinometer consists of sheets of tissue paper superimposed one upon the other, and divided off into squares, so that each successive square shall have one thickness of paper greater than the preceding square, the square marked No. 1 having one thickness, and so on up to No. 20, which has twenty thicknesses.

An actinometer of this description was described in a recent number of the Photographic News in an article on some experiments with Swan's light.

The substance is burned in glass globes containing pure oxygen, and the capacity of the globes is about one-and-a-quarter gallons. The results of some preliminary experiments are embodied in the following table.

No. of Expt.	Time of Exposure.	Distance from Light.	Substance burned.	Last Visible Number.	Developer.
1	20 secs.	6 feet	Sulphur and antimony, 10 p. c.	20·2 invisible.	Alk. Pyro.
2	"	"	Do. and do. sulphide, 10 p. c.	20·3 "	"
3	"	"	Do. pure.	20·2 "	"
4	"	"	Paraffin lamp.	8·1 visible.	"
5	30 "	14 "	S and $KClO_3$, 10 p. c.	18 "	"
6	"	"	S and Cu O, 10 p. c.	15 "	"
7	10 "	"	Sulphur, pure.	15 "	"
8	"	"	S and KNO_3, 10 p. c.	14 "	"
9	2 "	"	Phosphorus.	20 "	"
10	10 mins.	"	Paraffin lamp.	12 "	"
11	30 "	"	"	15 "	"
12	5 "	"	S 100, KNO_3 10, Sb_2S_3 5pts.	12 "	Ferrous Ox.
13	"	"	Sulphur, pure.	11 "	"
14	"	"	Magnesium in air.	14 "	"
15	"	"	Phosphoros amorphous.	15 "	"
16	"	"	Magnesium in oxygen.	20, No. 2 invisible.	"
17	"	Exposed to	a dull grey sky.	20, No. 1 visible.	"

In the above experiments only one light was used at a time.

---

* Read before the Glasgow Photographic Association.

Correspondence.

COMMERCIAL DRY PLATES.

Dear Sir,—I think it is well for any expressing their views on matters of general interest to avoid personalities, and to keep their language free from acrimony; these cannot forcibly serve any useful purpose, while they plainly indicate the inward feelings of the writer. I suppose it is the object of those who contribute to the pages of your journal to teach and instruct those who need teaching and instruction, not to show themselves off, nor to display themselves. I must confess that I was somewhat pained in reading the letters that appeared in your last issue on the subject of "Commercial Dry Plates." The writers have evidently made Captain Turton a butt, and have pelted him pell-mell. Now I take it that one is at perfect liberty to attack in fair way any principle, or opinion, or doctrine (call it what you may) that one considers to be erroneous, but I don't think the same liberty should be taken with the person himself who advocates it. If we find anyone in such a position, we should try to show him his error, and deal with him in a way calculated to benefit him.

To me, Captain Turton appears to overlook the fact that gelatino-bromide is but in its infancy. That rapid strides have been made in the manufacture of dry plates we must all admit; while, on the other hand, operators have become by practice far more expert in manipulating them. I judge that at the present time the most successful workers are those who have used the process most, have made a study of it, and have noted the various conditions under which good, bad, and indifferent results are obtained. Sometimes one is disposed to record as successful, certain methods which have in some instances given satisfactory results, when a link or links in the chain, so to speak, have been omitted—not gathered up by the observant operator, and consequently like results (although he follows, so far as he knows, exactly the same course) cannot be obtained. I think we must all admit this. In the gelatine process we operators have much to learn. That plates are sent out by first-class manufacturers capable of producing in experienced hands negatives of surpassing beauty, I, for one, cannot deny, as abundant proofs testify. I would rather lay the fault at my own door, and admit my inability, than charge manufacturers with the blame. They have much to contend with, undoubtedly, in the preparation of gelatine plates, especially in hot weather, and I have always found them willing to exchange plates with which I have been dissatisfied.

It is my conviction, and I state it without any hesitation, that anyone wishing to be a successful gelatine worker must not be afraid of using many plates that will never be registered in his list of good negatives; indeed, will have no other place in his stock-in-trade other than plain glass. One of the most successful workers that I know once showed me a whole pile of spoilt plates, when the prices were at the highest, too; but, said he, as I gazed in astonishment, "I can now get results that fully satisfy me," and his are among the finest dry plates I have ever seen. But he told me a few months ago that the manufacturer's plates (one of the best in the market) with whom he invariably dealt were so bad that he could not use them, and for some time had to use the wet process exclusively. Of course, when the prepared plates are bad (and I cannot but admit that the best manufacturers do occasionally send out inferior plates, but how, and why they do so, I cannot say—certainly not with a view of making a fortune, unless it be a bad one) it is useless to waste chemicals, time, and patience over them. The characteristics at the present time of a bad plate are, so far as my experience goes, fogging (not green fog, which I believe to be caused by too much ammonia in the developer), frilling, blistering, and a film that will not give a dense image unless sufficient ammonia be used, which in its turn, as I said, causes green fog. Of these the most important are the first and the last; the others—frilling and blistering—may be remedied by the alum and hyposulphite bath.

I must say, on behalf of high-class manufacturers, that up to the present time I have not, nor have any of my photographic friends, so far as I know, had a single negative "covered with spots, moons, comets, or stars." I am bound to say that. Weak and thin negatives I have had, some, too, with air-bells, plates that have frilled, fogged, and blistered also.

Possibly the spots, moons, &c., are caused through damp in some way or other attacking the films; but then, if only some of the plates in a batch are of that character while the rest give good results, one is drawn away from that conclusion. To me Captain Turton's experience is strange; I would not discredit it. Some of his strictures are severe; it is not for me to say that he is not justified in passing them. What I can and do say is, that I am unable to join him in them.—Yours very truly, J. Kay.

Dear Sir,—As this subject is one which affects both amateurs and professionals, I hope you will allow me to relate a recent personal experience bearing exactly upon the point in dispute.

Before starting for my usual summer cruise with a camera, I purchased from three well-known and rather expensive manufacturers a gross and a-half of gelatine plates. I had previously worked all of them, and had found them very good. During my holidays my stock was used side by side in a changing-box, preference being given to certain kinds for certain subjects, based upon previous experience.

On my return, I found, as I developed, that the plates supplied by two firms were all that could be desired, and most of them were faultless; but the remainder, some five or six dozen, proved absolutely worthless, and barely half-a-dozen will print at all. They developed nothing but dense fog, comets, and black bars.

Now, the conditions under which these plates were exposed and developed leave no doubt as to where the fault lies; but the commercial status of the manufacturers precludes any suspicion of intentional unfair play. Hence there must have been gross carelessness somewhere, and I fail to see that redress is such a simple matter as your correspondents last week imply. Perhaps the vendor will make good such plates, but what is to compensate the unlucky traveller or tourist for the loss of the chief work of the year, not to mention travelling expenses, chemicals, time, and temper?

There is a tinge of bitterness in this correspondence already, which can do no good. No doubt mistakes will happen, and faulty plates be thrown in the market; but for their own sakes manufacturers should take precautions which would prevent the supply of such absolute rubbish as the undersigned is prepared to submit for inspection.

An Amateur Subscriber.

Dear Sir,—Captain Turton has informed the world through your columns, and also by letters addressed to the Photographic Societies, how badly he has been treated by dry plate makers. Like other matters, this has two sides to it; will you permit me to narrate how the Captain himself deals with makers of plates? He favoured the firm of which the writer is a member with an order, not for "hundreds and thousands" of plates—we do not expect that from most amateurs—but for a few quarters. We recognised his name as one known to us, and supplied his order. Nothing more was heard till a short time after, when, on opening our morning letters, a most extraordinary epistle was found from the Captain, charging us with gross fraud in knowingly selling him plates which we were well aware were worthless, and threatening immediate exposure in both journals. Our first feeling was one of intense annoyance, but there was a certain extreme of absurdity about some of the experiences that induced us to try a different course to the one which occurred at the moment of receiving the letter. "No doubt," cries the choleric warrior in it, "you think I am some ignorant amateur to whom you can safely send your waste plates," &c. We wrote a conciliatory letter to him, assured him we had ascertained that the plates of the batch sent him had produced a large number of splendid plates in the studio of a well-known house, and that we had personally inspected them, but that we would *without charge* send him a fresh lot of plates, first having a sample taken from each box, and a negative taken on it to assure both sides they were good. This was done, the negatives duly taken and preserved for reference, and we begged Captain Turton to let us know what success he had with the new ones.

Some time passed without reply, and we wrote to him. No reply. We wrote again—still no answer. At length we invited him to pay for those originally ordered; and after a number of applications a P.O.O. came in an envelope for one lot only, without one word accompanying it.—I am, sir, respectfully, A Dry Plate Maker.

[This is a selection only from a mass of correspondence on the same subject.—Ed. *P.N.*]

RETURN OF SPECIMENS.

Dear Sir,—I noticed an article in your last issue by "Beau Nash" on specimens, and I can endorse his remarks by quoting a similar treatment. In November a firm in Kensington advertised for an assistant in retouching, &c., and I answered the advertisement, enclosing a specimen of retouching, and asked for the return of same if they were suited. After waiting a week I wrote again, and up to the present time I have heard nothing of them. I think the least they could do would be to return specimens, if not to answer my note. Hoping you may suggest some remedy for the evil,—Yours sincerely, An Assistant.

SAVING THE GELATINE DEVELOPER.

Dear Sir,—Can any of your numerous readers tell me whether the spent pyrogallic and oxalate developing solutions, together with the hyposulphite used for fixing in the gelatine process, contain a sufficient quantity of silver to pay for their being kept; and if so, what is the best method of throwing down the precious metal? Any information on the above will be gladly received, Mr. Editor, by your permission, through your correspondence columns. H. R.

HALATION.

Sir,—Reading your article bearing the above heading, I was induced to pen the following. It is generally understood, as stated in your article, that the greater amount of halation is caused by reflection from glass at back of film. If that is the case, how is it that gelatine dry plates give more halation than do wet plates? Wet plates are more transparent than dry, and consequently allow more light to pass through to the glass which supports the film. Two or three things I have noticed in working, particularly the ray of light mentioned by you, and which I have noted, when making enlargements, gives off halation before even it strikes the film; and if you place a lens so that a ray of light passes through it into a darkened room, it will be seen that besides the pencil of light there is a halo sufficient to account for any amount of halation that might be produced. Again, it seemed to me that the bright surface of the gelatine plate would reflect even before the light passed to the glass, and that, together with its extra sensitiveness, would make it more susceptible of halation than a wet plate. If halation is to be overcome, it must be before the light touches the film, for, as I stated above, it is given off by the beam of light in the camera. W. H. Logsdon.

P.S.—I may mention that in making enlargements, they are done in the dark-room with no covering between lens and plate. Does halation occur in contact printing, say from a negative or transparency? and if not, what of the reflection from back of plate theory?

DEXTRINE FOR MOUNTING.

Sir,—In your last issue of the Photographic News my formula for using dextrine is given. I should like to state a few more particulars. First, the dextrine should be a brown sample. The white makes a gritty mixture with no adhesion in it, and then in some cases a greater proportion of water is best, or else, if the mountant is kept long, it will become gritty and lose some of its adhesive power. In this case, heating it again will put it right. Half water and half spirit is perhaps safer if the spirit is quite strong.

The quantity of dextrine can be varied to suit the work, but I like it strong enough to adhere at once, and when the dextrine is stirred into the spirit and water, it should be heated until a clear solution results. It is best used cold and on dry prints.

For mounting prints that are to be hot-rolled, I prefer fresh starch paste and a damp print; but when the mounts cockle very much, the hot rolling renders them flat again. But where prints cannot be rolled, and the mounts are not stout enough to prevent cockling, I use the dextrine and a dry print stroked out with straightedge to make it lay smooth. I have mounted several collections of prints for travellers with the dextrine where the mounts or leaves of the book were only stout paper, and the cockling has only been very slight.

Solutions of glue and gelatine in alcohol I have found very good, but they require keeping warm, and in large work one end of the print will set while the other end is being pasted; but with the dextrine, 24 by 18 silver prints have been mounted with ease and no cockling.

The enclosed print is one out of 1,700 mounted with the dextrine, the print being rolled before mounting, and not damped save by the mountant; if a damp print and starch had been used, the result might have been different.—Yours truly, E. Williams.

RESTORING FADED MERCURIAL NEGATIVES.

Sir,—In reply to a recent query in the News, I give my experience of Schlippe's salt as a restorer of faded mercurial negatives.

Having seen a notice of Mr. W. E. Debenham's, of the efficacy of the above salt for the purpose mentioned, I looked up a number of old and faded yellow negatives, and have tried from twenty to thirty with entire success as to the restoration of printing capabilities. I have used a ten or twelve grain solution, and the result has been a vigorous negative of a yellowish red colour, requiring a strong light to print.

Although so much has been written as to the necessity of prolonged washing of gelatine films, I believe that most cases of fading can be traced to shortcomings in this respect, and I have also found that a negative which appears clear to the eye after fixing still contains silver salts, and I consider that the plate should remain in the hyposulphite several minutes after apparent clearness. In cases when mercurial intensification has to be used, perfect fixation and perfect washing are of the highest importance, and the neglect of these precautions is the chief cause of stains and yellowness. In cases of stains existing in faded negatives, the action of Schlippe's salt has been various, and the result bad; but every clear negative that I have tried has come out perfectly. The enclosed print is from a negative originally over-exposed and intensified, and which faded almost entirely out, becoming a positive of a light yellow colour. It was absolutely impossible to print from it before the application of Schlippe's salt, and the result speaks for itself. I use the bichloride mercury and iodide of potassium intensifiers, and I have found that with long fixation and good washing, finishing up with an immersion in a solution of one drachm *eau de javelle* to fifteen of water, and drying the plate before intensification, fading and yellowness are quite exceptional. W. Cotesworth.

Sir,—Some time ago I published a method of restoring mercury-faded negatives to printing density, by converting the metal into a sulphide. Schlippe's salt was chosen as the sulphuretting agent, as it has not nearly such an offensive odour as solution of sulphuretted hydrogen or sulphide of ammonium, and moreover keeps much better. If an alkaline sulphide were to be used instead of Schlippe's salt, I should have preferred sulphide of sodium, on account of the objections named to the ammonium compound.

In the last number of the Photographic News, I saw an article by Dr. Eder recommending sulphide of ammonium for the purpose named. Will he kindly state what are the advantages which he considers it to possess over the Schlippe's salt plan previously published, which I am glad to hear from others who have tried it, has been as successful with them as with me.—I am, yours, &c.,

W. E. Debenham.

PHOTOGRAPHIC EXHIBITIONS.

Sir,—It is quite time that attention should be called to the ill-treatment of pictures sent to the Pall Mall Exhibition, and I am glad to see the ball set rolling by Mr. Daniel, who is not alone in having cause to complain of the careless way in which exhibits are treated. I have now exhibited some four or five years, and have *never* had my pictures returned without their being more or less damaged; this year in particular, they have been treated in a shameful manner, the frames being chipped, scratched, and, in fact, utterly spoiled. I trust the Society will see the necessity of making such arrangements in future as to prevent exhibits being thus injured.

In strange contrast to the state of exhibits returned from Pall Mall is the condition of pictures recently returned from the Swan Exhibition at Newcastle. It affords me great pleasure to testify to the admirable and careful manner in which the packing has been done at Newcastle. Cannot our Society take a lesson from Messrs. Mawson and Swan, and return pictures in *something* like the condition in which they are sent?—I am, sir, your faithfully,

Edward Brightman.

THE CRYSTAL PALACE ELECTRIC EXHIBITION AND PHOTOGRAPHY.

Dear Sir,—I believe a large number of photographers anticipate seeing something at the forthcoming Electric Exhibition at the Crystal Palace in the form of electric lighting apparatus applied to photography; but they are likely to be disappointed. I applied for space, and power to work two new dynamo-electric machines to be used with two new electric lamps, and suitable apparatus for photographic printing, and have received the following reply:—

Crystal Palace Co., Crystal Palace, S.E. Nov. 24, 1881.

Sir,—In answer to your application of the 20th October, I beg to state that we are not able to accept your proposed exhibit, as we have no class for photography or photographic apparatus.—Yours faithfully, S. Flood Page, *Manager*.

It seems to me somewhat strange that the Crystal Palace Company should refuse a proposed exhibit of electric lighting applied to photography.—Truly yours,

A. J. Jarman.

[It does seem strange, since Paris did not consider its exhibition complete without it.—Ed. P.N.]

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly meeting was held on Tuesday, at 5, Pall Mall, J. Glaisher, Esq., F.R.S., in the chair.

Mr. Wing, of Tunbridge Wells, was elected a member of the Society.

Captain Abney then made a communication on the subject of halation, in which he argued that halation was not due to the turbidity of the glass, but to scattered light. He evidenced the fact that blotting paper placed at the back of the plate did not prevent halation, and detailed a number of experiments he had made in regard to its cure. The most perfect backings he had found were asphaltum or bromine dissolved in gum, either of which answered perfectly. In the course of his remarks, Captain Abney stated that the so-called photographs of the sun's corona exhibited by a German professor were nothing more or less than halations; and that had the plates been backed in the manner described, there would have been no indication of a "corona."

The President, in referring to this matter, said the photographs of the corona had surprised him greatly, and had caused him to suspect the photographs which had been taken of the sun's corona during an eclipse.

After a vote of thanks to Captain Abney, Mr. Mucklow exhibited and explained a new sensitometer and actinometer, the invention of himself and Mr. J. B. Spurge. The principle of the actinometer was the admission of light through a series of graduated holes, each hole being opposite to a dark room or chamber. It was claimed for it that the light passing directly upon the plate was more certain, and constant results could be obtained. For a maximum of light, Mr. Mucklow used daylight, and for a minimum, Balmain's paint.

Captain Abney (who had now taken the chair in consequence of the president being compelled to leave early through indisposition) said he had tried the instrument, and had been greatly pleased with its efficacy and simplicity.

Mr. Cowan observed that the great point of the instrument seemed to be the absence of an interposing medium.

Mr. Maxwell Lyte thought that the reflection from the sides of the darkened chambers would have some little influence apart from the light which entered through the holes. Mr. Lyte described some experiments he had made while in the Pyrenees, to determine the actinism of the light at certain times of the day. The method he adopted was by pressing chloride of silver into the form of a stick, and exposing to a tint corresponding to tints which he had painted on paper. The stick was, of course, filed white previous to exposure.

Mr. V. Blanchard might say, with regard to the constancy of the records of the actinometer, that he had made some experiments on two different days when the light varied considerably; yet the registrations were as reliable in the one case as in the other. With regard to the use of magnesium wire or calcium light, he found that the effect of the exposure on Balmain's paint was just the same at twenty seconds as at forty or sixty, showing that, the full effect having been once obtained, a longer exposure made no difference.

Mr. Bolas thought that the same defects to be found in other actinometers were also to be found in Mr. Mucklow's. The geometrical ratio did not hold good in the case of points of light distributed over the plate. It was just as impossible to get two black surfaces to correspond exactly, as it was to get two white, or two phosphorescent ones.

Mr. Mucklow explained, in answer to the various observations, that his experiments were not quite complete, and that he had not decided what ratio, in regard to the number and size of the holes, would be the best for the general working of photographers. He had endeavoured to construct the apparatus so as to correspond as nearly as possible with the construction and working of the camera. He would be glad if any photographer would favour him with his ideas, so as to render the instrument as perfect as possible.

The Chairman remarked that his experience did not quite correspond with that of Mr. Bolas. He had found it quite possible to get phosphorescent surfaces which were perfectly constant. He did not think that the reflections from the inside of the darkened chamber would make any appreciable difference; certainly not where the exposure was short, as in the case of a gelatine plate.

A vote of thanks was then passed to Mr. Mucklow.

Mr. C. R. Woods read a paper on the production of brown and blue transparencies by the use of uranium salts and ferric hydrate. Mr. Woods afterwards exhibited transparencies in the lantern, produced by his process, the colours being brown, blue, and green. He also pointed out that pictures produced in this manner were absolutely permanent.

The Chairman having referred to the care with which Mr. Woods had conducted his experiments, and the use to which his process could be adapted in the exhibition of special subjects, announced that the officers who retired at the next annual general meeting were the president (Mr. J. Glaisher); the vice-president (Mr. J. H. Dallmeyer); the treasurer (Mr. J. Spiller); and six members of the council—viz., Professor Stokes, Lieutenant Darwin, Colonel Stuart Wortley, and Messrs. York, W. Bedford, and L. Warnerke. These gentlemen were eligible for re-election, and the nomination papers were to be sent in on or before January 23rd. The Chairman stated that the number of visitors to the Exhibition was 6,221, the numbers in 1880 and 1879 being respectively 5,000 and 4,800. On the closing day, no less than 776 visitors were admitted.

It was announced that the next technical meeting would be on the 27th inst.

The proceedings then terminated.

Thursday Evenings for Photographers.

At the meeting on the 8th inst., Mr. A. J. Brown in the chair,

Mr. W. Ashman, referring to the crystalline appearance of a negative shown at the last meeting, and attributed by Mr. Henderson to the breaking up of the varnish through damp, and by others to the presence of hyposulphite of soda, showed a negative from which the hyposulphite had been eliminated by boiling water, after having previously been soaked in a saturated solution of chrome alum; this negative had been placed in water for two minutes, with the result that the varnish was broken up in a number of glass-like crystals.

Mr. HENDERSON had tested the powdery appearance on his negative, and found it clearly due to the presence of a resin in the varnish.

In answer to a question as to which contracts most in cooling—a glass disc, or a brass ring just encircling it? Mr. W. K. BURTON said that brass contracts about three times more than glass.

Mr. HENDERSON had noticed that a much sharper image could be seen on the focussing glass and obtained on some days than on others, and he had tried with some amount of success warming the cell of the lens, and placing a hot flannel round it.

A suggestion was made that the lens should be screwed in an india rubber washer.

Mr. J. CADETT showed a piece of mosquito netting (sixteen meshes to inch) which he found very useful for filtering emulsions, the meshes not filling up as in ordinary canvas.

Mr. HENDERSON had found in using canvas of a similar nature that the particles of bromide of silver adhered to it after all the gelatine was gone, and that unless the bromide was removed by means of a solvent it would give black spots, and possible fog in the next batch of emulsion passed through it.

The CHAIRMAN said he had placed the silk exhibited by him at a previous meeting in nitric acid, the result showing that it was not pure silk. He had also found that glass coated on one side with a solution of aurine and gelatine, and on the other with rosine, varnished with matt varnish on one side and with ordinary negative varnish on the other, gave a perfectly safe light.

Mr. HENDERSON repeated an experiment shown him by Mr. Swan, which consisted in placing two lights about two feet six inches apart, one being a naked flame and the other covered with a ruby globe, the naked flame being reduced in intensity to make it equal with the ruby light; upon an opaque object being so placed as to produce shadows on the wall from these lights, the shadows seemed to be reversed. He suggested that this peculiarity might be useful as a means of more safely illuminating the dark-room.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary meeting was held at the Freemason's Hall on Tuesday Evening, December 6th, T. H. MORTON, M.D., President, in the Chair.

The principal topic discussed was the forthcoming Exhibition, which was arranged for January 23rd, 1882, and following days, at the Cutlers' Hall, Sheffield.

Mr. G. V. YATES exhibited a positive and negative "enlarged portrait" prepared upon "Morgan's gelatine paper." The positive, being waxed, made a fine transparency, giving great facilities for touching up, &c., and the negative was a print from the same upon albumenized paper, fixed without toning, and then waxed. From this, of course, any number of prints could be made. They were brought to show the capabilities of the gelatino-bromide paper.

Mr. J. TAYLOR then exhibited a square camera, for 12 by 10 plates, of his own construction and design, and arranged on a new principle. The camera possessed all the ordinary movements, had no loose screws, and was very portable and light.

The CHAIRMAN observed that it possessed more real novelty than any camera he had seen.

Mr. STRINGFELLOW remarked that it was a most light and efficient apparatus.

Other members also expressed their approval.

THE PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting was held on Friday, the 9th inst., in the Royal College of Science, Dublin, Mr. THOMAS MAYNE, T.C., in the chair.

The minutes of the last meeting having been confirmed, Mr. John Russel was elected a member of the Society, and the names of seven gentlemen were proposed for election at next meeting.

Mr. E. ROPER showed a large collection of views which he had taken during a recent tour in Belgium, and which were much admired, as well as some pictures by Mr. Reynolds exemplifying "Story-telling by Photography," which were remarkable examples of composition work.

Mr. ROBINSON exhibited samples of printing on silk by Guihery, of London, which were much approved of for their beauty.

Prof. BARRETT exhibited a small apparatus for pictures one inch square, in which a novel method of changing the plates with the aid of springs was made use of.

Beaty's patent camera for wet plates in the field was exhibited and explained by the inventor.

The consideration of the new instantaneous shutter by Messrs. McGhie and Bolton, of Glasgow, was unavoidably postponed until next meeting.

Talk in the Studio.

LIGHTNING PHOTOGRAPHY.—At the close of a paper (which we hope to publish in our next) read before the Northumberland and Durham Photographic Association, Mr. J. P. Gibson gives the following hints deduced from his own experience with lightning photography:—Only try it at night when there is no vestige of daylight to fog your plates. Have the sidereal focus marked beforehand on the camera. Use the most sensitive gelatine plates you can get. Back the plates with some non-actinic material to prevent halation. To prevent confusion in results, expose so as to get only one flash on a plate if possible, and when you have developed the plate the requisite time, do not be disappointed if at first you do not see any result, as it may require almost microscopic search to find it. And finally, if you get no result except utter failure, try again, and hope for better luck next time.

To Correspondents.

All Communications connected with Advertisements and Business to be addressed to Messrs. PIPER & CARTER, "*Photographic News" Office, 5, Castle Street, Holborn, E.C. Advertisers are requested to make all Cheques payable to* Messrs. PIPER & CARTER, *and crossed "Union Bank, Photographic News Co. Account."*

*** MR. HOLROYDE'S PAPER NEGATIVES.—We hope to publish a communication from Mr. Holroyde on this subject next week.

T. J. M.—It is extremely probable that the size used in the manufacture of the paper has undergone partial decomposition in places. The spots may, however, be due to contact with dirty fingers or other source of contamination.

G. E.—If you send a copy, together with eighteenpence in stamps, to our Publishers, the registration will be effected by them.

W. E. D. JONES.—1. We prefer collodion for the purpose. 2. The series of Photographic Handy-Books published at our Office will be found to include all you require. 3. Thanks; if not now, perhaps later on.

J. B. PAYNE.—The Xylonite Company, Homerton, E.

S. S.—1. Add more gold to the solution, and when a sufficient quantity of the purple incrustation has accumulated, you can re-convert it into chloride of gold. 2. If a portrait lens, and in fairly good condition, it might fetch any sum from 10s. to £2 at a sale.

W. G. HONEY.—1. The only alteration we would suggest is the touching out of the numerous white specks between the child's hand and the water. Were it not for their number, position, and other circumstances, they might be taken for fragments of bread. 2. Not sufficiently sharp to make a good enlargement.

CHARLES H. HATCH.—1. If we were to watch your mode of procedure we might suggest. 2. Yes.

COPYRIGHT.—If there is still any copyright in the engraving, we are inclined to think you would be infringing it; but as you put the case, a somewhat difficult point is raised.

T. LUCK.—At a temperature of about 7° C. below the freezing point a separation of crystals takes place, these containing two molecules of water of crystallisation.

R. F. FULTON.—It is of unfrequent occurrence, the small excess of acid which is ordinarily present serving to prevent the deposition.

CAPTAIN S——.—Only when the porous medium is tolerably dry.

JOHN SMITH.—Dilute the collodion with ether and alcohol, rather more of the former being used than of the latter.

TYRO.—1. Just as you suppose. 2. Much over-exposed. 3. Under-exposed. 4. About right. 5. Rarely employed in the present day. 6. By heating a mixture of sulphur and lime to about the melting point of silver. 7. Out of doors, by all means.

BARBARA.—1. Thank you, we shall be glad to have particulars. 2. Not at present.

BEN JORDAN.—1. Very remarkable—at least, if you have not made a mistake. 2. Dilute with an equal bulk of benzole. 3. A stronger bath should be used.

T. L. C.—We are afraid that the law is against you, and that you must submit to an obvious injustice.

KENTISH LAD.—1. Not in the slightest degree. 2. Only till it shows a very faint alkaline reaction. 2. Sixty grains to each ounce of solvent.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1216.—*December* 23, 1881.

LIBRARY

CONTENTS.

PAGE
The Magic Lantern 601
Mercury Intensifiers 601
Hints on Business Management—Keeping Letters........ 602
Bye-the-Bye.—About Publishing and Selling Christmas Cards, Birthday Cards, &c. 603
Photography In and Out of the Studio 604
Keeping Gelatine Plates. By B. J. Edwards 605
Increasing the Sensitiveness of Plates by Free Silver Nitrate. By Alfred J. Brown 605
Notes........ 606
French Correspondence. By Leon Vidal........ 607

PAGE
Topics of the Day.—On Washing Gelatine Emulsion. By William England 607
Impedimenta for the Field. By J. C. Stephens (Dunedin, N.Z). 607
The Chemical Action of Light. By Dr. J. M. Eder 608
Lightning and Lightning Photography. By John P. Gibson... 609
Mercurial Intensifiers. By W. H. Davies........ 610
Sizing Photographs for Oil Painting. By Thomas Gulliver ... 610
Correspondence 611
Proceedings of Societies 611
Talk in the Studio........ 612
To Correspondents 612

THE MAGIC LANTERN.

The older forms of lantern which served to delight our grandparents when they were children are now almost defunct, the numerous improvements which have been made of late years having elevated the magic lantern into a valuable aid to the practitioner of many branches of applied science; but the photographer—whether professional or amateur—may derive special advantage from the use of this instrument in one or more of its various modern forms.

For the production of enlarged photographic images, either on a plain screen with the mere view of displaying a picture to advantage, or on a sensitive surface in order to obtain a lasting reproduction on an enlarged scale, the magic lantern is specially adapted; the lime-light being generally used in such cases.

Several very successful portrait photographers make it a practice to endeavour to detain their most promising sitters while an assistant produces transparencies from one or more of the negatives just taken; and experience shows that the display of these on the screen to the sitter frequently leads to profitable orders for enlargements. Another way in which the photographer may turn the lantern to profitable account was well illustrated by an incident which occurred in the east end of London some few years ago. A grocer who carried on a well-to-do business in a main thoroughfare possessed a side window which faced some little distance down a somewhat dark side street. One evening our friend the grocer was chatting with the neighbouring photographer on the trials of business generally, and the unprofitable nature of the side window in particular, when the latter suggested a lantern display, either every evening, or as often as circumstances should render advisable. In accordance with this suggestion, on the evening of the following Saturday a wet screen was stretched in the window, and the limelight lantern was employed to project enlarged images of advertisements and notices informing the public where they could obtain the "finest teas of the season," and "butter of guaranteed purity." Our friend the photographer, who prepared the slides and managed the affair, took care that the spectators should have something more than mere reproductions of letter-press to amuse them, so he interpolated a series of views of the neighbourhood and portraits of local celebrities, taking care, however, to make it known that any who patronised his studio would be photographed in an equally satisfactory manner.

The grocer had reason to be well satisfied with the result of the experiment, but the photographer probably made the better thing out of it, as he not only realised a considerable sum in making slides for neighbouring tradesmen who arranged with the grocer for this ingenious kind of publicity, but he so far improved his own business that he now keeps six assistants, instead of working single-handed as formerly.

We have noticed a very ingenious form of lantern in use for advertising purposes in the city, the image being directed downwards on to the pavement by means of a reflecting prism or mirror. As an advertising instrument the lantern has large applicabilities, and those who can profit most by this use of the lantern are the photographers, as the only slides likely to be used to any extent are photographic transparencies.

◆

MERCURY INTENSIFIERS.

One of our correspondents recently sent us a description of a new kind of fog to be added to the many already in existence. He called it an apparently yellow fog, which was produced by trying to intensify a gelatine negative with mercury, the image becoming at the same time, if anything, less dense than before the application of the mercury solution. Certainly, if this were a common evil, it would be very serious; but we have never heard of another case of it. Fortunately, our correspondent gives at the same time a cure for the evil—namely, soaking in potassium iodide.

He considers the yellow fog to be caused by a deposit of mercuric oxide; but this is not possible, because—firstly, the formation of mercuric oxide is highly improbable; and secondly, if it had been formed, it would not have been in any way acted upon by potassium iodide.

To take the first of these objections more at length; presumably the negative was first immersed in a solution of mercuric chloride. Had this solution contained any iodide of mercury dissolved in it, the phenomena would have been simply enough explained, because the iodide which is yellow or red might have been deposited in the film, and it would have been readily dissolved by potassium iodide; but, unless by some strange accident, it is next to impossible that there should have been any such impurity in the mercuric chloride. Another possible and equally simple explanation would be the presence of a soluble iodide in the ammonia employed; in this case, unless the mercuric chloride was very perfectly washed out, which takes a long time, a precipitate of mercuric iodide would have been produced in the film, and, as before, dissolved out by the potassium iodide. But neither of these is at all a likely explanation, as an iodide is not an impurity which under ordinary circumstances occurs either in mercuric chloride or in ammonia. The only way in which we think it would be possible that mercuric oxide might be produced, is by the ammonia containing caustic potash, which would cause a precipitate of mercuric oxide when added to mercuric chloride. But this is not much more probable than either of the former suggestions; besides, the oxide would not have dissolved in potassium iodide, which our correspondent states that his yellow fog did. Besides completely destroying the yellow fog, our correspondent says that the application of potassium-iodide actually intensified his negative, bringing it in a few minutes to a good printing density. This is even less easy to explain than the clearing away of the fog. It is not difficult to speculate on possible explanations of this: but to actually state what the chemical action was, is a very different matter. As speculations—though, unfortunately, nothing better, we may say—suppose metallic mercury had been precipitated on the image, the addition of potassium iodide would cause the formation of the dark-green mercurous iodide, which would probably have the effect of rendering the image more dense. Or, it is just possible that potassium iodide might have some similar action on metallic silver; but this is going a little too far, as no sub-iodide of silver is as yet actually known, although its presence has been mooted. This speculation, however useless it may be in other ways, at least shows how very complicated and difficult all problems with regard to mercury intensifiers are, and how little we can count on what will happen under any given circumstances, even when we know quite well what substances we are working with, and also know what happens when these substances are mixed in a test tube.

We cannot help thinking that the gelatine of the film has a great deal to do with with this uncertainty, for gelatine is a substance of extremely complicated and variable composition, and may modify in various ways actions which would be otherwise perfectly simple. As an instance of this, take the case of silver chloride; when not mixed with gelatine, it is darkened by light under almost any circumstances, except, perhaps, when in presence of a considerable excess of free chlorine. But if chloride of silver is precipitated in a gelatine film, light has no action upon it, unless some reducing agent be present; if this were not so, if chloride of silver in a gelatine film would darken, we might intensify gelatine negatives in the following manner:—Bleach the negative as usual in a solution of mercuric-chloride; this substance combines with the metallic silver of the image to form a mixture of sub-chloride of mercury and chloride of silver, both of them insoluble white powders; then expose the negative to light until the silver chloride becomes black. If then the negative were not sufficiently intensified, immerse it in very dilute ammonia, just as in the ordinary process, the negative would then become considerably more dense than if the treatment with ammonia followed immediately on that with mercuric chloride, because in addition to the black compound of mercury and ammonia, there would be present in the film metallic silver, produced by the action of light on the chloride; and this process would have the very great advantage that it could be repeated any number of times, each repetition introducing into the film a little more of the black chloride of mercury and ammonia.

Many photographers seem to consider that it is but labour lost now-a-days to work out new processes for intensifying gelatine negatives; especially do they think this of new mercury intensifiers. The argument these generally make use of is, that there are already so many good, bad, and indifferent processes known, that we have no need for more. Another very common argument is, that there is—or should be—no need for any intensifier, and that sufficient density should always be attainable by proper development. This would be all very well if it were true, which, unfortunately, it is not—at least, in general.

Without doubt there are some plates in the market so very good that it may well be said that if perfect negatives are not obtained the fault lies with the photographer—or, at any rate, not with the plate maker. But whatever may be the reason, it is sometimes scarcely possible to get a negative of proper printing density, however well it may be developed. It may be that the plates are at fault, or possibly the light—or, what is much more likely than either of these, the developing solution or the photographer. At any rate, whatever the reason may be, intensification is frequently necessary, and this being so, it is absurd to suppose that one and the same intensifier will act equally well for all defects of any make of plates. Now it seems to us that it would be a very interesting investigation to get a number of negatives of exactly the same appearance, and all requiring intensification—or, instead of a number of small negatives, one very large one cut into pieces would be better—intensify those negatives with every process that has hitherto been published, and note the difference in quality of print obtainable from each; we think we may affirm with confidence, that the difference would be very great, and completely independent of any difference in the density gained by the different processes.

But even supposing we omit this very important consideration, we ask, is there any method of intensifying yet known which is not open to the very gravest objections? All the great variety of mercury intensifiers are more or less open to the fatal objection of non-permanency. The silver intensifiers seem to be difficult to work, and at best uncertain in their results, and very liable to give hopeless red fog. In a word, we do not at all admit that there is no need for new intensifiers, and by new we do not mean the addition or substraction of a few grains from the strength of a solution, but we mean processes that are essentially different from any of those at present known.

Therefore we say, let all those who have processes answering to this description by all means publish them, however useless they may be in their crude form; some one else may think of an improvement which will make them practicable—perhaps useful; and, at any rate, every detail which is known always increases the sum of our knowledge in this important and difficult subject, and so is a step, at least, towards an ultimate success, or the discovery of an intensifier for gelatine negatives to which there will be no really serious objection.

HINTS ON BUSINESS MANAGEMENT.—KEEPING LETTERS.

Have any of our readers ever had the unhappiness of wading through a mass of correspondence to find some particular letter which he remembers perfectly well he has kept, and that it is most important to refer to? If so, he may, perhaps, have registered a vow (mentally) to have some better system of keeping his correspondence, only to find he has had no time—or possibly inclination—to go through a large number of letters, the accumulation probably of years. It is only on the recurrence of the difficulty and annoyance many times, that at last he does really set about the clearing up the long-standing neglect and disorder. Many such cases have come within our personal experience, and it is now an article of faith with us to keep letters of business in a convenient form, so that they can be referred to in a moment.

Although some writers are so vague that more than one construction can be put on their written communications, and others are so forgetful of what they have written, or what orders have been given, that nothing but producing their own words will convince them, it is a great advantage to have a written order, not only in case of dispute or uncertainty, but also for reference if the order is complicated, or any length of time elapses before it is fully executed. But of how little use it is to have this power in our hands if it is rendered valueless by want of care on our parts, and the means being given us, we so neglect our privilege as to turn it into a source of irritation and annoyance.

As soon as a letter is answered, or order acknowledged, the spare paper should be taken off, the letter folded to a convenient width (about two inches), docketted outside with the date, name of sender, and nature of contents briefly, as "Order," "Enquiry," "Change of address," &c., and once a week these put in pigeon-holes alphabetically arranged, according to the initial letter of the sender's surname. It will be found necessary to remove these letters every six months, or more frequently, according to the size of pigeon-holes and number of letters received; each packet should then have an elastic band or gummed paper put round it, and be made easily distinguishable by the initial letter, and also have on the dates the letters cover, as from Jan. 1st to June 30th, 1881. These packets can then be kept in a drawer or other convenient place that is easy of access. The elastic bands are to be preferred to paper, as they permit of any letter being withdrawn and replaced without undoing a packet, or disturbing any other letters.

Even in the case of a large business receiving many letters, by taking off the superfluous paper, very little room is taken up; and the comfort to the mind in knowing that, when wanted, any particular letter is at hand, is incalculable.

In the same manner, all paid accounts should be kept. The file is an abomination; and to go through a lot of dusty bills on the chance of finding some particular one, that most likely you do not find, is one of the most wasteful, as well as aggravating, processes imaginable.

Economists of time will, we are sure, find that nothing is more profitable or more conducive to equanimity of mind, than having method in these minor details of business.

By-the-Bye.

ABOUT PUBLISHING AND SELLING CHRISTMAS CARDS, BIRTHDAY CARDS, ETC.

Gradually, but surely, the photographer is gaining ground and insisting upon a share in the good things that are periodically dispensed by that most generous of patrons—the general public. The competition in producing tasteful and fanciful productions in the way of designs and pictures was confined, not long ago, to an annual display of valentines, the valentines in question being, as a rule, made up of laced paper and floral studies. *Nous avons changés tout cela*, and now, in place of a single day in the year, we have Christmas Day, New Year's Day, Easter, and St. Valentine's observed by people in general, and birthdays by everybody in particular. Moreover, paper lace and gaudy flowers no longer suffice for valentines any more than does the cock-robin and snow-pressed roof suffice for Christmas Day. This is an age of progress with Christmas and birthday cards, as with everthing else; and as soon as there is a cessation to progress in this particular phase or craze, the end of it will not be far off; that is to say, if shopkeepers to-day could put before their customers nothing better in the shape of valentines and fancy cards than the fragile perforated paper productions of twenty or thirty years ago, there would cease to be a public to buy them.

Photography, as we have said, has stepped in with novelty, or, indeed, something better than novelty, and, what is more, the public has declared itself very favourable to our art in this particular connection. We might enlarge upon the opportunity, and point out that there is one other indication that photography is growing into a fine art, since it is elbowing its way to the front among the little fine art productions that so often adorn festive cards, the public having recognised the fact in an unmistakable manner by readily purchasing photographic productions. In these latter there is not only beauty and grace, but there is life and truth besides, conferring an ineffable charm upon the tiny pictures. All photographers of standing—they are not numerous, it is true, just now—who have occupied themselves with this particular branch of the art, have simply "sold out" all they have produced, and in some cases are quite unable to respond to the call for more than has been made upon them. The pictures these gentlemen have sent to market are so vastly superior in the art of pleasing than are the cards produced by painter and draughtsman, that while the former are in great demand, the latter are a drug in the market.

During the past summer, it may be remembered, one enterprising firm of makers of Christmas and New Year cards held a competition, and gave away numerous prizes for the purpose of ensuring new and tasteful designs; we took upon ourselves to suggest to the gentlemen in question that there should be prizes also for cards in which photography played a part; but the reply we received was to the effect that photography was not deemed suitable for such purposes. These gentlemen must alter their opinion now that such photographic cards as are in the market are most favoured by the dealers and the public, and that the limited character of the supply is the only limit to the purchasers.

There is, then, indication that in future photographic cards will play a very important part, and for this reason we have made it our business to learn something about them in the trade, and the way in which such cards are bought and sold. We have paid several visits to retail traders, and have also acquired some knowledge of wholesale dealings, so as to place before our readers a little information on the subject. But first, just a word to those who are contemplating making their fortunes in the matter. The public, though a generous patron, is a very knowing one; it will not buy rubbish. The art quality of a "card" stands high at the present day, and every year it mounts still higher. A production that readily sold last year, may not sell this, and this year's cards are likely to be beaten by those that come next Christmas. Again, not only must the little photographs be fine, clear, and pretty, but they must, like jewels, have a tasteful setting. The mounting, framing, and disposition of the photograph is as important as the photograph itself, and the success which has attended the sale of photographic cards has been due to the fact that they have been put before the public in a tasteful manner.

The usual price to the public of a nice card is one shilling, and that is the sum for which most of the photographic cards are sold. But the producer does not get half this amount, and here there is stumbling-block No. 2 in the way of he who proposes to make his fortune rapidly. As a rule, the producer gets no more than twopence halfpenny for a card that sells at a shilling. This is due in a great measure to the original valentine trade, for the stock was of such a fragile nature, and its demand so circumscribed, that dealers refused to buy at all unless they saw their way to a large profit. This was only fair, no doubt, for stale unsold valentines of paper lace must be a drug in the market, indeed. But with cards whose intrinsic value is higher, and which are available for different seasons, or for bithdays, the matter is different, since the dealer has more chance of effecting a sale; yet, as we have said, he enjoys the same benefits as he did when nothing was brought him but old-fashioned valentines.

But it is not only the dealer who demands a large profit. There is the wholesale firm who must also be paid. We have said that, generally speaking, two-and-sixpence or three shillings a dozen is paid to the producer. Now into whose pocket does the difference between three shillings and twelve shillings go? Well, in the first place, there is such a thing as the public itself demanding discount, and it is not unusual, when large purchases are made, to ask for an abatement of twopence in the shilling. This, however, is not at all general, and when it does prevail there is still a large balance to be accounted for. The photographer or producer may, if he is careful, get a penny profit out of every card he sells, but he certainly never gets any more. The wholesale firm, on the other hand, who buys of him, wants much more, and so does the retailer. The former, on a shilling card, not unfrequently makes threepence, and the latter fourpence or even fivepence. But then, in fairness to the former, it must be remembered that he has to pay heavy commissions and expenses to travellers, &c., while the retailer has also a handsome shop to pay for, and runs the risk of having much of his stock unsold.

We took in our hands the other day two cards, one being a painted miniature photograph upon opal gelatine, such as Mr. England has recently issued, and the other a tiny vignette on a dainty cream mount with gilt border, and these cards we laid before a respectable dealer in a provincial town. Would he buy such things, we asked, and what price would be given for them? His answer was—for the plain vignettes he would have no difficulty in getting a shilling a-piece, and they would be worth, therefore, eight shillings a-dozen to him; for the other he could certainly get two shillings, and for that reason would offer sixteen shillings a-dozen. Here, at first sight, seemed to be an explanation of the whole matter, viz., that the wholesale firm benefited by far the most; but a further explanation put matters in another light. The sums the shopkeeper named as being willing to give were subjected to a discount of twenty per cent.; nay, if he paid cash down at once, it sometimes happened he could get as much as twenty-five per cent., which latter would reduce the eight shillings to a matter of six. He, the retailer, would thus make fourpence profit on every card sold, supposing he gave a discount of twopence in the shilling, or sixpence if he did not. In the latter circumstance, if he sold three-quarters of his stock, he would do good business.

Is it possible for the photographer to do without the wholesale firm? Yes; but this is what he must do. He must be his own "traveller," and "travelling"—to get a man to part with his money—is an art. Secondly, he must have a large choice of goods; wholesale firms give retailers not a choice of a dozen or two dozen pictures, but of two or three hundreds, so that if only a score of cards are selected, these may be of all sorts and sizes. Thirdly, he must be early in the field, and if he has a novelty, be able to flood the market with that novelty before others have time to imitate it. In a word, he must be a *man of business* as well as an artist, if he wants to put in a claim for business profits. As to being early in the market, it may interest our readers to know that only those who make their arrangements in the spring and early summer can hope to find a market for Christmas goods; the retailers have given their orders, and sometimes parted with their money, before autumn comes.

Still there are exceptions to every rule, and any firm of photographers who can produce a real novelty, at once attractive and taking with the public, should have no difficulty in placing it anywhere and at any time. Only, they must remember that if they cannot flood the market at once, they will be beaten with their own weapons; and that unless the productions represent, beyond all doubt, work of very high quality, few shopkeepers will be found to make a *second* disbursement after having made their regular purchases for the season.

The "At Home" next week will be "Herr Schaarwächter at Berlin;" the following "By-the-Bye" will be "On Finishing Carte Pictures."

◆

PHOTOGRAPHY IN AND OUT OF THE STUDIO.

Gelatine and Collodion—Photography and Novelists—Amateurs' Apparatus.

Gelatine and Collodion.—Mr W. D. Valentine—in his pleasant paper, "Half an Hour on Photographic Matters"—offers some suggestive remarks on the difficulty of one man working both wet and dry plates successfully. The experience of most gelatine workers, especially those who have gone straight from collodion, and had not hitherto given much attention to dry plates, is, that the methods of proceeding are so different, and the education, both of the eye and of the judgment, so dissimilar, that to go from one process to the other, and then back again to the first, is fatal to any hope of excellence in either. It is very significant that many portrait photographers have fully recognised this difficulty, and have boldly solved it by discarding collodion altogether. We are inclined to think they are right. To take up with gelatine plates, and, at the same time, to have a silver bath and collodion in reserve, is very much like swimming in corks. A worker with gelatine plates must have perfect confidence in, and familiarity with, his materials, or he will continually run the risk of failure. The silver bath and collodion in reserve may be a feasible idea in theory, but in practice, we fancy, is likely to be rather the cause of annoyance than of assistance. It is of no use to say "there can be no harm in retaining a bath for wet plates," for, as a matter of fact, unless a bath is kept in regular work, it soon becomes out of order; and few men will be found who every morning will filter their baths, and try collodion and developer, when they know that in all probability they will not be called upon to use either one or the other. The more one depends upon a process to do certain things, the more is it likely the process will answer one's expectations. To those, therefore, who think they can work both gelatine and collodion side by side, we give Punch's hackneyed advice, "don't!"

Photography and Novelists.—Photography is gradually taking its place as a useful part of the mechanism of the novelist. No one yet has availed himself, in the case of a murder, of the alleged photographing on the retina of the eye the object the eye last rested upon previous to death, because, unhappily, science has not definitely determined the accuracy of the theory, and is, on the whole, rather opposed to it; but in other ways photography has come in handy. We need not refer to the degrading purpose to which Mr. W. H. Mallock has turned an album of photographs in his novel, "A Nineteenth Century Romance;" but we may point out that in one of the Christmas annuals the hero is an amateur photographer, and the whole action of the story turns upon the photograph (which is accidentally secured) of an Asiatic chief while stealing a famous diamond from the crown of a German prince. Probably the author has a little knowledge of photography, and the old proverb as to a "little knowledge" has proved true; for, with an audacity at which an experienced photographer would have shuddered, he has put down on paper a series of details which not even the most imaginative operator can reconcile with the known properties of the sensitized plate. Here is the story. The amateur photographer arrives at the jewel tower late in the day. The crown containing the famous diamond is placed on a stand in an upper chamber, and the photographer, having focussed, proceeds to expose. At this moment the keeper of the jewels rushes in, having discovered some error in the date of the photographer's order of admission, and forbids him either proceeding or taking away his camera. The photographer accordingly departs, and the keeper of the jewels, being vexed at his own want of care, determines to make up for it by sitting up all night to watch the crown. Some time during the evening his grandson comes up with a message that the old man is wanted, and knocking against the camera, accidentally removes the cap. The jewel keeper goes out of the chamber, and is absent for some time. Meanwhile the Asiatic, who has been concealed in a cock-loft above the chamber, makes his way into the latter, and cuts the diamond from the crown with a pair of scizzors. The author naively remarks, "He must have had a powerful lantern"—and we should say so—"and held it close to him," for an image faint and blurred is imprinted on the sensitized plate. This plate seems to have had the most marvellous good fortune. When the old man discovers the loss of the jewel, he knocks over the camera, which is fractured, and becomes enveloped in the focussing-cloth. It is with some difficulty the photographer gets his camera back, and then it is fished "out of some (providential) black hole" still "wrapped in its own cloth," and the photographer carries it back to his lodgings, when it is only on examining the fractures that he finds out the cap is missing. Nevertheless, he proceeds to develop the plate, and finds, as we have said, that he has secured a faint image of the robber's profile. We need not point out that all this, if not perfectly impossible, is more than highly improbable, but in novels it is only the unexpected which happens; and besides, if the novelist, like the poet, is not to be allowed a little licence, what is to become of him? But the story must give the public very queer ideas of the capabilities of photography.

Amateurs' Apparatus.—A correspondent of a non-photographic journal has found a difficulty in the tripod stands sent out with the "marvels of cheapness" in the way of amateur apparatus. He says, at present the tripod "either assumes the appearance of an alpenstock or a case of fishing tackle, and both are conspicuous when sauntering out of town. If a tripod could be devised to shut up like a closed umbrella the inquisitive multitude would be relieved of the effort requisite to mentally speculate what the amateur had in his parcel, and why he had it invariably with him; although the said multitude might on other occasions question the sanity of the amateur if it saw him marching through the rain with his 'umbrella' down. Now six triangular pieces of ash 2 feet 6 inches long with ¾ inch sides would form a nice size, but the joints to make two pieces into one leg, and the attachments to the base-board and the handle of the 'umbrella' are difficulties." We have no doubt that any of our makers of apparatus could solve these "difficulties;" but *cui bono?* Why this sensitiveness on the part of amateurs, and their desire to make photographic apparatus look like something else? Why masquerade with cameras which look like opera glasses, ditto which bear a resemblance to blunderbusses, and tripod legs which may be taken for umbrellas? Why should not a camera be a camera, and tripod legs be tripod legs? When umbrellas were first introduced they were looked upon as fearful and wonderful things, but the multitude soon got used to them; and so it will to tripod legs.

◆

KEEPING GELATINE PLATES.

BY B. J. EDWARDS.

The question is often asked, "How long will gelatine plates keep before and after exposure?" I propose to give the results, as far as completed, of a few experiments made with a view of obtaining a practical answer to the above query.

With regard to the keeping qualities of gelatine plates before exposure, there seems to be a diversity of opinion, many eminent photographers prefer plates that have been made some time, and they are in the habit of laying in a stock of plates with the idea that they improve by keeping; others prefer plates freshly prepared. For my own part, I have not been able to detect the slightest difference between plates carefully kept for twelve months, and the same quality freshly prepared. Plates that have a tendency to frilling (a defect in the manufacture which need never occur) are doubtless improved by keeping, inasmuch as after a few months they will not show this defect; on the other hand, unless gelatine plates are carefully stored, they are liable to serious deterioration, the great enemy to be guarded against being damp or moisture. In a dry atmosphere I have kept plates in perfect condition over two years; other plates of the same batch which were purposely kept in a damp place, were completely spoiled in a comparatively short time.

The above and a number of other experiments seem to prove that gelatine plates, if kept dry and protected from atmospheric influences, will retain their good qualities for an indefinite time before exposure. As to the length of time plates can be safely kept after exposure, I should like to complete further experiments before venturing a definite opinion. I think, however, it will be found that very shortly after exposure the image begins to suffer gradual deterioration, and that in order to obtain the best results the negative should be developed as soon as possible. Last year I exposed a number of plates of the same batch at a watering place on the coast, some of the negatives being developed within a week, others in about six weeks, and the remainder nearly twelve months afterwards. The two former lots gave clean brillant negatives, with plenty of density and almost bare glass in the deepest shadows, while those developed last all turned out worthless, the negatives being thin ghostly images, without intensity or contrast. This result may have been partly owing to contact with the moist sea air at the time of exposure, and subsequent keeping without being again perfectly dried.

I do not think that with gelatine plates there is such a thing as the continuating action of light (as in sensitized carbon tissue), nor do I think that the addition or otherwise of a small quantity of iodide to the emulsion has the slightest effect on the keeping qualities of the plates.

As to the best mode of storing plates, I would suggest the use of tin boxes as nearly air-tight as possible (biscuit tins would answer the purpose), care being taken that the packages containing the plates are quite dry before being put away, and the tin boxes kept closed until the plates are required for use.

◆

INCREASING THE SENSITIVENESS OF PLATES BY FREE SILVER NITRATE.

BY ALFRED J. BROWN.

Some few months ago, Dr. Eder published in the News a means of increasing the sensitiveness of gelatine plates by steeping them in a weak alcoholic solution of silver nitrate. I tried it at the time, and although I could never attain the great increase of sensitiveness he claims—three or four times, I believe—I met with some degree of success, perhaps twice. It is scarcely possible that Dr. Eder could have been experimenting with plates containing free bromide; but at the time, this was the only reason I could assign for the great increase of rapidity. However, it struck me that this was not due to any change in the plate itself, provided it was well washed, but to the free nitrate being present in the developer, enabling a denser image to be built up with a given exposure than would otherwise have been the case. This I found to be so, and got about the same result as by steeping, and the film was not stained at all by using the nitrate this way. I communicated this to a Thursday meeting, and asked others to try it, but have heard no more of it until the question was brought forward the other evening at the Club, when I repeated my remarks.

Since then I have treated a number of plates both ways, using artificial light, with an actinometer and drop shutter for daylight. I tried three different batches of plates; one of them rapid, and one of the other batches slow ones containing iodide; the result is failure to get any increase of speed *either* way. I took the silver solution from the same bottle, which I find labelled—

Water (distilled)	1 ounce
Silver nitrate	30 grains
Ammonia	20 minims

For use—

Alcohol	½ drachm to 4 ounces

If any one has any experience of Dr. Eder's method, perhaps he will record it; I do not remember seeing any notice taken of it as yet. Should the doctor himself happen to read this, perhaps he will kindly help me out of my difficulty.

Notes.

The French photo-astronomer, M. Janssen, publishes in *La Nature* a reproduction of a photograph of comet *b*, the spectrum of which, it may be remembered, Dr. Huggins has secured in his telescope camera at Tulse Hill. The comet, however, is not of so much importance as certain other phenomena that appear in the photograph, and which plainly demonstrate that our art is likely to serve for astronomical investigations in a way that few imagine. Certain rectilineal rays are shown in M. Janssen's picture, which are quite a revelation; and, moreover, the photographic plate exhibits several stars which are not shown on any celestial map.

M. Janssen states that his plate was of gelatino-bromide of the most sensitive make, and that he developed in absolute darkness, so as not to run the risk of marring the most delicate latent impression. To his great care and forethought, therefore, as a photographer, may be attributed the important discovery he has just made.

"You will find it easily, as the enclosed is a reduced photograph of a local map, and the position of my house is marked in red ink." This was the concluding paragraph of a letter we received from a well-known scientific man and an enthusiastic amateur in photography.

Any photographer who would carry out the idea by introducing diminutive photographic maps as a heading to note-paper, would make a good thing of it. We make our readers a present of the hint.

Says the *Echo*, on the subject of American photography:—"Mr. Gutekunst is credited with the largest photograph in the world. It is a panoramic view of the Centennial Grounds in Philadelphia, and its merit consists in the fact that, although it is printed from several negatives, it is impossible to detect the joins. The picture is on a sheet of paper ten feet long by about eighteen inches in height. Similar pictures have been produced before, but in those cases the 'joints' spoilt the effect. In the higher branches of the art the English and Continental photographers are still the leading lights, but in such feats as those mentioned above the Americans are decidedly ahead. A photograph ten feet long, which, printed from seven negatives, appears as if taken at once, is a feat worth recording."

We are unable to agree with our contemporary. If English and Continental photographers are so much ahead just now, it is surely strange that our London shop windows, as well as those of Paris, Vienna, and Berlin, should be flooded with pictures by Mora, Sarony, and others. Again, our contemporary does not make it clear whether the panoramic photograph measures actually ten feet, or is "on a sheet of paper ten feet long." But it does not much matter. Mr. Gutekunst is too capable an artist to attach much importance to the fact that he has cleverly suppressed in his panorama what the *Echo* terms "joints."

Messrs. Negretti and Zambra enjoy the right of photographing at the Crystal Palace; hence it is, we hear, that other photographers are warned off the Electric Exhibition.

Mr. W. T. Morgan is busy with a patent, which has for its object the production of concave sensitive films. We are to have tablets of concave form, which are to be nothing more nor less than sandwiches of bromide paper and tin foil, the concave shape being for the purpose of humouring the lens and preventing distortion.

We mentioned the other day that we sat for a portrait in Mr. Laws' gas-lit studio at Newcastle; but we did not mention—because we did not know it at the time—that the picture he produced was a very good one—so good, indeed, that it might have been secured in the golden daylight of a summer's morning, instead of on a murky November afternoon.

Mr. Guihery sends us one of his pretty cabinet pictures on rose-tinted silk. As we have already pointed out—before we knew anything of Mr. Guihery's sensitized silk—photographs upon fabric make capital mats, d'oyleys, &c., if they are edged with suitable fringe; only we prefer prints upon white silk or cambric, and backing them with red glazed calico, which can easily be detached for washing.

The terrible catastrophe at Vienna, when nearly a thousand persons lost their lives by the burning of the Ring Theatre, has happily left the photographic circle of the Kaiserstadt unharmed. "No photographer that I know of," writes Dr. Eder, "is missing; but, unfortunately, several chemists."

"A week before the disaster," writes our friend, "it had been arranged to photograph the stage, lighted by electricity. Herr Leyde, from Adèle's studio, took a trial plate by way of preliminaries, and arrangements were made for a set scene. But the disastrous fire intervened, and now photographers have been called in to perform the melancholy service of depicting the ruins, and, worse still, the remains of all the dead who have not yet been recognized. These duties are, of course, undertaken under the auspices of the police."

Leaving your shadow behind you exerts an influence almost as uncanny as the man in the German legend who had no shadow at all. Nevertheless Mr. Bolas, at the Society of Arts, recently demonstrated how shadows may be left on the wall very easily, and as the experiment is an effective one, some of our readers might like to repeat it this Christmastide. Get a bit of canvas—a portion of an old photographic background will do—and brush it over with luminous paint. Put this against the wall of a room in which the lights have been turned down, and ask some one to sit against it, showing his profile, and wearing his hat and pipe, if possible. Burn two inches of magnesium wire to illuminate the profile, and when the sitter gets up, it will be found that he has left his shadow behind him.

Topics of the Day.

ON WASHING GELATINE EMULSION.

BY WILLIAM ENGLAND.

The method I am about to describe is so different to that usually recommended and practised by many makers of emulsion, that I should be very diffident about bringing it forward; but it has answered so perfectly in my hands, and I so much prefer it to all others, that I shall make no apology for trespassing on the patience of your readers.

I shall presume that the emulsion has been made by any of the usual methods, and after boiling and adding the necessary quantity of gelatine, allowed to cool to (say) 120°. I pour it in a flat-bottom glass dish; this may be constructed with a sheet of glass, with a wooden frame about an inch deep. This dish, when used, may be put on the levelling-slab used for setting the plates. In this way the emulsion will flow in equal thickness over the bottom, and, when the weather is warm, I use a zinc box with a cover, sufficiently large to allow the dish to be placed in it, resting on pieces of metal at the sides, and allowing a space under of three or four inches, into which I place a few lumps of ice, which makes the gelatine set very rapidly. After it is quite firm I draw a silver dessert fork across it, cutting the emulsion into strips, the width, of course, of the prongs of the fork.

Now, with a piece of glass about an inch-and-a-half wide, take off the emulsion and drop it into a gallon pickle-jar. The latter must be fitted up in the following way:—Procure a large cork bung which will fit the mouth of jar. Pull over, or rather under, the bung a piece of chamois leather; this will make it fit tight, and keep bits of cork from getting in the emulsion. Now make two holes, and put in each a piece of glass tubing about a quarter-inch bore—one piece to reach to the bottom of the jar, and the other about an inch through the cork. Now attach to each tube a piece of red rubber tubing (this is free from sulphur).

Now we will suppose that the emulsion has been placed in this jar (of course, in the dark-room), and the stopper fixed in. It may now be carried into the light, and one of the rubber tubes attached to the water-tap. This tap must have a union attached, which should be plugged with cotton-wool for the water to filter through. This is very important, as any one may see if they examine the cotton-wool after each time of using, for it will probably be covered with dirt and iron rust. *Since adopting this precaution, I have never had a single batch of emulsion which has given me spots*

The washing may be continued for about twelve hours, allowing a very small stream to run through, after which drain off the water, and turn out the contents of the bottle on a hair-sieve, to thoroughly drain. This method of washing the gelatine emulsion may seem very tedious by the long account necessary to describe; but I can assure those who may feel disposed to try it, that it is, after they have the necessary utensils—which are very easy to make or procure—extremely simple.

The "Topic" next week will be "My Studio—An Ow'r True Tale," by an ex-Photographer.

FRENCH CORRESPONDENCE.

Shutters of Different Kinds—Abuse of Patent Monopolies.

Shutters of Different Kinds.—If I were to attempt to describe all the instantaneous shutters which are continually being produced, I should never come to an end. At the meeting of which I am speaking, I saw a circular shutter by M. Civiale, which I did not think offered any advantage over others of the same kind; also one by M. Lecanu, arranged so as to close or open simultaneously two stereoscopic lenses. An interesting point in this latter apparatus is that it works behind the lenses. At this point it must be observed that when objects in motion are to be taken in all their successive positions, as is done by Mr. Muybridge, it is necessary to have the shutter behind the lens, in order to be certain that the image is always full in front. M. Paul Boca was at the trouble of demonstrating that with his shutter any predetermined length of exposure could be accurately obtained. I do not think there would be any use in repeating his arguments here, especially as they would be too long. Sufficient to know that if an exposure of one-fiftieth of a second is required, it can be accurately realized; this can be experimentally verified with great nicety by means of a large disc graduated into sixty divisions, over which a needle makes one revolution in a second. A photograph of the disc is taken while the needle is in motion, and it can then be seen in the plate how many divisions the needle has moved during the exposure. This method of verification seems to me to be better than any formula, and to give the measure of the rapidity of the shutter with the greatest accuracy.

Abuse of Patent Monopolies.—There is a very great tendency to take unfair advantage of the rights conferred by a patent. It is now very common to take out a patent for some invention that may have been long known, and thus to shackle its free development, and to monopolise its manufacture. Monsieur Fortier has endeavoured to put a stop to this tendency; he has of his own accord withdrawn the patent which he had lately taken out for his sensitive pellicle, with the object of making it perfectly free in the market. This, however, has not prevented other manufacturers from coating paper, or insoluble gelatine, or a plate of collodion, with gelatino-bromide, and of securing for their manufacture the right of monopoly. Now, supposing we were to use a layer of gelatine-bromide alone, without any support—supporting itself, in fact—could that be made the subject for a patent? Surely, that would be too absurd. I have just seen the description of a patent which includes the whole of the gelatino-bromide processes. The rights of working any branch of photography might equally well be claimed by patenting a general treatise on the subject. M. Balaguy showed some prints taken on gold-beater skin, the making of which he has not yet patented. Here is a substance possessing great flexibility, tenacity, and transparency, and never previously employed in photography. Is not this a chance for the admirers of monopolies? The only true patent, the only monopoly which is incapable of being attacked, is that which is obtained by excellence of manufacture. Mr. Swan, Messrs. Wratten and Wainwright, Dr. Van Monckhoven, and other equally celebrated makers, are not protected by any patents, and yet they are practically in possession of a monopoly, for their manufacture is too good to be imitated.

Leon Vidal.

IMPEDIMENTA FOR THE FIELD.

BY J. C. STEPHENS (DUNEDIN, N.Z.).

The heavy and somewhat cumbersome box tent is a great drawback on the pleasure of field working to the wet plate man; and I am surprised that the umbrella has not been pressed into the service. However, better late than never; I therefore broach the idea, more especially as it will be found equally useful for dry as well as wet working. For use, on the ferule end of the stick a ring should be fastened so as to have free play, and on the ring a tolerably good sized hook, for the purpose of hanging on to the limb of a tree, or any suitable projection; at the handle end insert a piece of iron rod, with a screw-thread cut on it, and a nut to fit, to support a small tray, on which to stand the necessary articles in use. Of course the covering of the frame must be made light-proof, with sufficient thickness of black or yellow calico; the top being thus provided, the sides to reach from the rim to the ground, say six feet in depth, and of as great a circumference as may be desirable. At the bottom edge a series of riglet holes should be placed for the insertion of wooden pegs to secure it to the ground. This side-piece may be independent of the covering of the frame in make, suitable provision being made to secure the two together. A cord from each corner of the bottom of the tray to one of the ground pegs will keep that steady. Of course a suitable sill window must be inserted in the covering, to give just as much illumination as may be necessary for operating. With such a tent the dry plate man need only carry one dark slide with his camera and stock of sensitive plates.

Heavy or Light Apparatus.—Some months since I observed in the News an inquiry if something could not be devised to lessen the weight of the camera and its adjuncts. For this purpose, why have not apparatus makers utilized *papier maché?* Cameras, with the necessary dark slides from this material, would be exceedingly light, and equally as strong, if not stronger, than those of wood; could be cast, moulded, or pressed into the solid shape from the pulp, or made from the sheet; and if the pulp was thoroughly impregnated with oil of birch (similar to the so-called Russian leather), would be particularly serviceable for India, as not being liable to the ravages of the white ant.

Studio Working.—Photographers as a race must, I think, be strongly conservative, or they would banish from their studios the old flat rectangular backgrounds, and adopt the American semicircular one, which certainly tends to give more air to the picture, and consequently roundness—or the modern term, modelling—to the figure. A simple and comparatively inexpensive method of making one of these backgrounds may be found useful. Make a skeleton frame of the size and sweep required, and then get a piece of plain unfigured kamptulicon or linoleum of the size to cover it, and paint of the required shade of colour; as these materials readily mould themselves to the frame, there is no need of tacking, and one frame only would be required.

THE CHEMICAL ACTION OF LIGHT.

BY DR. J. M. EDER.*

Combinations Produced by Light.—When a mixture of chlorine and hydrogen is exposed to light, the gases combine to form hydrochloric acid, and if it be a bright light, as that of the sun, they do so with a loud explosion. This combination is effected behind blue, but not behind red glass. Fabre and Silbermann found that the maximum effect in this experiment is produced by the indigo blue rays between the lines G and H of the spectrum. According to Bunsen and Roscoe, there are two such maxima; one between G and H, then a decrease of the action towards H, followed by an increase up to the line I at the commencement of the ultra-violet, finally gradually vanishing in the ultra-violet. Before the boundary of that part of the spectrum which is visible in fluorescent light is reached, and also in the red end, no action can be detected. The time which elapses before the first traces of the photo-chemical action—the so-called photo-chemical reduction—are observed, as well as that before the maximum of that action takes place, varies according to circumstances. The duration of the exposure necessary to produce the first effects—or, rather, the maximum of photo-chemical induction—depends on the intensity of the light and on the length of the glass prism through which the light is refracted. Under the influence of light the resistance to the tendency to combine is removed, but is restored again in the dark. The resistance to the combination of hydrogen and chlorine is increased by the presence of foreign gases; for instance, ·0005 part of oxygen reduces the action of light from 100 to 9·7. In an ordinary explosive mixture of chlorine and hydrogen gases, in which, besides the heating, a chemical effect is produced, the absorption co-efficient for gaslight is = 0·00427; whereas in a gaseous mixture of the same density, but in which the chemical effect is not produced, the co-efficient is only = 0·00289, or much less; the difference of these two numbers gives the absorption co-efficient of those rays which are not employed in producing the chemical effect. Bunsen and Roscoe have, however, shown that these figures vary considerably with the nature of the source of the light.

The combination of chlorine and hydrogen is also effected by the light of Bengal fire, by gaslight, by the Drummond light, by the electric light, by the light of burning magnesium, and by that of the flame of a mixture of carbon disulphide and nitric oxide. Chlorine also acts on several organic compounds when exposed to the sunlight—as, for instance, marsh gas, ethylene, acetic acid, citric acid, ethylic ether, alcohol, benzol, and napthaline—but in the dark there is either no action at all, or else one which is far less energetic. Bromine and iodine behave in a similar way with the organic compounds, particularly in the case of marsh gas and ethylene.

Light promotes oxidising action in many cases. Metals like lead, arsenic, and antimony, according to Schönbein, oxidise much more rapidly in the light. Mercurous oxide (sub-oxide of mercury) exposed to the rays of the red end of the spectrum takes up oxygen, and turns of a red colour; but violet light destroys this colour again. As this action takes place also in a vacuum, Becquerel believes that the substance splits up into metallic mercury and mercuric oxide. Oxide of lead (litharge) particularly that prepared in the wet way, darkens in the light, and turns gradually of an orange colour, and then brown; this change only takes place in the presence of oxygen with formation of minium, since in vacuo or in an atmosphere of hydrogen gas, the alteration does not occur. According to Levol, the oxidation is promoted by the presence of an alkali, and Davy found that it took place more quickly in red than in violet light. Schönbein states that lead sulphide in the form of thin scales oxidises in the light rapidly, and is converted into lead sulphate, and he was able to take photographs by the discolouration of paper which had been impregnated with the former compound; Steinheil also obtained photographic copies in this way.

Cuprous chloride (subchloride of copper), under the influence of light, and more especially in the moist state, becomes violet, or from that to dark brown; this change occurs under water or under hyposulphurous acid, but not under glacial acetic acid. Probably an oxychloride is formed in the light. Copper plates fumed with chlorine, bromine, or iodine, behave in the same way; plates affected by chlorine in this manner show a maximum of sensitiveness to the rays of the spectrum between the lines H and M, and a second maximum at D, and bromised plates exhibit a similar sensitiveness (Becquerel). It may be mentioned that copper plates that have been fumed with iodine, bromine, or chlorine, after being exposed to the camera, can be developed by means of mercury vapour like a Daguerreotype picture. Talbot first discovered this process, and took out a patent for it in 1841, and contemporaneously Kratochwila made the same observation, afterwards corroborated by Schultz-Sellack.

Green vitriol (ferrous sulphate) oxidizes more energetically (from 1·2 to 1·6) in the red rays, and less energetically (from 0·1 to 0·6) in the violet than in the dark (taking the oxidation in the latter as the unit). Ferrous and manganous hydrates act in the same way (Chastaing).

Metallic arsenic placed in a solution of caustic potash with free access of atmospheric air, suffers an oxidation = 1·0 in the dark, from 0·93 to 1·00 in violet light, from 1·04 to 1·20 in the red, and 1·00 in the green. Arsenious acid also, in a dilute alkaline solution, oxidises more rapidly in the red, and more slowly in the violet, than when protected from the light.

A dilute solution of sulphuretted hydrogen in water oxidises most quickly in the red rays; sulphide of sodium exposed to the air deposits sulphur, and hyposulphite is formed: but there is a difference in this reaction, according as it takes place in the light or in the dark, and the oxidation is most promoted by the red rays. Dilute sulphurous acid is converted by the action of the air into sulphuric acid. and, according to Chastaing, more especially in the violet rays; but being secluded from the atmosphere, it separates into sulphur and sulphuric acid. The sulphites are not acted on by light if preserved from contact with the air.

---

* Continued from page 593.

Light promotes the combination of the oxygen of the atmosphere with the hydrogen and carbon of organic substances.

Nascent oxygen acts in the sunlight upon benzole in a different way than it does on the same substance in a diffused light; in the former case phenol is formed, in the latter, not (Leeds). Ether, aldehyde, oil of cinnamon, oil of bitter almonds, oil of turpentine, oil of lemons and xylol, oxidise very rapidly in violet light, more slowly in the green, yellow, and red, and most slowly in the dark (Chastaing). Phenol turns red most energetically in the violet rays in consequence of the oxidation of its impurities Impure, or not sufficiently rectified benzine, becomes of a darker colour in the light with oxidation (Niépce); the same holds good of Dippel's oil (a product of the destructive distillation of bones), and also of creosote. Mineral oils under the influence of light absorb oxygen and convert it into ozone, which readily oxidises any substance it may come in contact with (Grotkowsky).

The fatty oils become viscous in the light (Sennebier), oxidising gradually, and in producing this reaction the more refrangible rays are the most energetic. All the reactions of olive oil are modified by the continued exposure of that substance to the air and light; with nitric acid it does not turn green as it would under other circumstances, and with soda ley it does not become yellow, but white; if the exposure be continued a long time, it loses the property of setting when mixed with mercurous nitrate (Moschini). By free exposure to the air and light, pig's fat turns acid and rancid, the essential oils of mint and camomile and red palm oil become bleached. Linseed oil varnish thickens quickly in the sunlight; in thin layers it rapidly oxidises, and becomes insoluble in ether (Laborde). Solution of tannin in alcohol or water can be kept for an unlimited time in the dark, but exposed to the light it absorbs oxygen. Pure and dry tannic acid turns yellow in the light quicker than it does in the dark. According to Warner, the extract of green walnuts also alters its colour more rapidly in the light than in the dark.

(*To be continued.*)

LIGHTNING AND LIGHTNING PHOTOGRAPHY.

BY JOHN P. GIBSON.[*]

In treating of two of the great agencies of nature, heat and electricity, Professor Tyndall comes to the conclusion that they are both modes of motion, and that in many respects they are inter-dependant and mutually convertible; and he proves experimentally that from heat we can obtain electricity, and that, conversely, from electricity we can obtain heat.

From electricity we can undoubtedly obtain light, and our worthy president and fellow-townsman, Mr. Joseph Swan, has shown us how that light may be divided and utilized at our own hearths and homes, and doubtless he will make his discovery as successful financially as it is scientifically, thus obtaining from electricity the most precious of metals—gold.

The little photographic results I lay before you to-night help to pile up the evidence, already conclusive, that from electricity we can obtain actinism, or the chemical action of the rays at the violet end of the spectrum, upon which photography depends for its very existence,

In the relations of lightning to photography it may be well to consider its duration and its actinic power. The duration of an artificial electric spark as measured by Wheatstone, with a mirror revolving at the rate of 800 times in a second, was the twenty-four-thousandth part of a second. The duration of the illumination produced by lightning is certainly less than the ten-thousandth part of a second. This has been established by observing a rapidly rotating disc divided into sectors, alternately black and white. If viewed by daylight the disc appears of a uniform grey colour, and if lightning occurring in the dark renders the separate sectors visible, the duration of its light must be less than the time of revolving through the breadth of one sector. The experiment has been tried with a disc divided into 60 sectors and making 180 revolutions per second, so that the time of turning through the space occupied by one sector is one-sixtieth of the one-hundred and eightieth of a second—that is, one-ten-thousand eight-hundredth part. When the disc turning with this velocity is rendered visible by lightning the observer sees black and white sectors with grey ones between them, thus showing that the duration of the flash must be less than the one-ten-thousand eight-hundredth part of a second.

By increasing the rapidity of the revolutions, or the number of sectors, still more accurate results might be got; but for the black and white sectors to be seen sharply without intermediate grey it would require the illumination probably to be about two-hundred and fifty-millionth part of a second, as that is the time which Mr O. N. Rood, an American observer, estimates as being requisite for distinct vision of a black line. The experiments by which he arrived at this conclusion were worked out with the aid of the electric spark, and are recorded in the "American Journal of Science and Art," series 3, vol. ii., p. 139, and are alluded to by Dr. Carpenter in his "Human Physiology," p. 828. Accepting this statement as being approximately correct, how great a gap exists between the action of our so-called instantaneous shutters, and the time taken by the eye to receive an impression, the most rapid shutter yet invented not claiming to work in less than two-hundredth part of a second, the eye receiving its impression in less than one-millionth of that time. The extremely short duration of the flash seems to the unscientific observer to be quite incredible; almost every one I have conversed with on the subject saying, "Impossible! I have seen a flash last quite a second." I reply, "Quite true, the impression made so rapidly on the retina is not so rapidly and readily effaced, and while that impression remains there, you continue to see, or fancy you see, the lightning." Impressions on the retina never seem to last less than one-tenth of a second, and in many cases they last for seconds, minutes, and even for hours. A very simple and effective illustration of the persistence of the impression on the retina is given in the use of a toy—popular some years ago—the Thaumatrope. In it two objects are painted on opposite sides of a card—a bird, for instance, on one, and a cage on the other; and when, by twisting a pair of strings, the card is made to revolve about one of its diameters in such a manner as to be alternately presenting the two sides to the eye at minute intervals, the two pictures are blended, the bird being seen in the cage. The optical illusion which it presents to us has its cause in the persistence on the retina after the object causing it has passed from view, and has been succeeded by another object, the impression of the two combining and forming a harmonious whole. As impressions on the retina, however faint, remain there at least one-tenth of a second, we may fairly conclude that the impression of a vivid flash of lightning may remain for nearly a second after the disc itself has disappeared.

In the case of the sensitive plate, however, the actinic action can only go on as long as the flash lasts, so that to obtain a photograph of a flash we must have a plate sensitive enough to receive impressions in at most the ten-thousandth part of a second. We have no means of knowing as yet how quickly a photograph of the sun can be taken, as the exposure required is much shorter than any we have the means of obtaining with our present mechanical appliances. It, however, seems likely that the electric spark may furnish us with a sensitometer of much greater delicacy and exactness than we at present possess. On the evening of 5th July last, we had a very violent thunderstorm, which made itself felt over an unusually large area. At about half-past ten o'clock, whilst I was watching the brilliant flashes of lightning which followed each other in rapid succession, the idea suggested itself to me to try to photograph a flash. I at once went for my whole-plate camera, and got ready three of Swan's plates of ten times the rapidity of wet collodion, these plates having been previously backed with red paper to prevent halation. The lens I used was an eight and a half inch Ross rapid symmetrical with largest stop but one. As the rain continued to fall very heavily I was unable to go into the open air to work, and I opened the lower sash of a window in a room on the top storey of the house, and placed the camera on the window seat, propping it up with a cushion so that it should point upwards at an angle of about twenty-five degrees from the horizon.

---

[*] Read before the Newcastle-on-Tyne and Northern Counties' Photographic Association.

How to focus was now the question. I found it quite impossible to focus the lightning of any object outside, it being quite dark, and there being no distant light in view, and I was reduced to the expedient of removing the camera and focussing a lighted candle, placing it at as great a distance from it as possible indoors. As that distance was under thirty feet, a slight shortening of the focus was then made to get as near as possible to the correct focus of parallel rays.

Should I again attempt lightning photography I will have the camera adjusted exactly in daylight and the focus of parallel rays marked distinctly on it. Knowing that any attempt to take off the cap of the camera when the flash came would be perfectly useless, after putting in the sensitive plate I placed the camera in position, turned it to the S.S.E., the direction in which the most vivid flashes of lightning appeared, took off the cap, waited for a flash, and replaced the cap immediately after it. The first plate was developed with pyrogallic, ammonia, and bromide of the ordinary strength, and was unsuccessful. In the second the tiny flash, or I should call it splash, of light characteristic of electrical action came out on development, but there was no continuous track of the electric fluid shown. At about 11·45 p.m., the time of exposing the third plate, there were brilliant flashes of forked lightning appearing at irregular intervals, and between these there were on the south-east part of the horizon flashes of sheet lightning, which lighted up the sky behind the branches of a tree close at hand.

Being anxious if possible to secure a photograph showing these branches, I exposed the plate immediately after one of the bright flashes of forked lightning, and continued the exposure until the next vivid flash of forked lightning came. In that time, which, as near as I can guess, was from one minute to one minute and a half, there were about about six flashes of sheet lightning in the south-east. On developing, I found that these flashes had slightly illumined the sky behind the tree branches, leaving the branches themselves quite dark, the track of the bright flash being shown at first by splashes of light at intervals, and finally by a continuous track of light. Upon the wet slates of a distant house five or or six repetitions of the reflection of the largest splash of light may be seen in the original negative. The transparency is a direct print on bromo-gelatine paper, the negative being placed in a magic-lantern as a slide, and the image thrown upon sensitive paper as a screen. It is magnified about 18 diameters, or about 324 times. As the lens was not a photographic objective, but only the ordinary thirty shilling lens used in the sciopticon magic lantern, part of the flash is not so sharp as it might be got with a proper apparatus.

I think we may conclude that the actinic action of the flash is not continuous, but is greatest at the angles where there are splashes of light, as if an explosion of gases produced by the chemical action of electricity upon the atmosphere took place at each change of course in the flash. Between several of the splashes, at the commencement of the flash, no connection is apparent, and from the last splash but one the line is only faint; but from the last and largest splash the track of the electric fluid is continuous—not being straight, but curved, and being terminated by two dagger-like points turning off nearly at right angles to the general line of direction of the flash.

◆

MERCURIAL INTENSIFIERS.

BY W. H. DAVIES.*

Referring to the action of mercury in its several forms of chloride, bromide, and oxide, as an intensifier, as set forth in the paper by Messrs. Burton and Laurie, I may at once commit myself to the statement that in no one of the proposed methods can we find what is really wanted, viz., the production of an image that will remain stable when exposed to light.

For many purposes the use of the mercury intensifiers is good, and does the work well, as in such negatives as are wanted for photo-lithographic purposes, where the continued darkening of the silver is of no consequence; but it is very different with delicate negatives with half-tone, which after a time become mere patches of black and white. Probably the best method of using it is to make a pretty strong solution—in fact, it may be saturated—and to this add 10 per cent. of iodide of potassium, cover the plate as in developing, reducing the strength when using, and keep on till dense enough; a wash of iodine will deepen it still further. The watery solution of 10 per cent. iodide potass with *quant. suff.* of crystalline iodine is best to use, and of about the colour of dark sherry.

The bin-iodide of mercury is very fleeting. When I was induced to begin the discussion of the paper on Mercurial Intensifiers, I little thought how little could be said on the subject. Doubtless the way in which our authors treated the subject was in the highest degree scientific and explanatory; but when I came to discuss the matter as our worthy Secretary requested me to do, or begin the discussion this evening, I felt myself in somewhat of a difficulty. Mercurial intensifying has been one of the many agencies in use for strengthening the sometimes weak image in iodo-bromide of silver, as we have it in the wet collodion process, or in the pure bromide of the dry gelatine plate, and as such must be treated with some kind of respect, what everone may think of its doings, either with silver as we use it, or with the noble metals generally; indeed without that volatile metal, much we do with silver could not be accomplished, therefore we must treat *quick* silver with respect.

At one time its use was tried as a pigment, and it is a magnificent scarlet, but, like all the other compounds, with the exception of vermilion, whose base is cinnabar, very fleeting, and thus has been put aside. It is not so fugitive in combination with silver, but renders the negative very hard; however, where only a ghost of an image is on the glass which cannot be intensified in any other way, this method will do when nothing else will. On the whole, then, I may conclude with again warning against the mercurial chlorides, bromides, or iodides, except in very special circumstances. The white chloride seems to be the only one of the series which is at all stable, but it lacks intensity. The *modus operandi* is to develop, fix, and wash in the usual way. Then take a solution of thirty grains of chloride of mercury dissolved in warm water, with fifteen of chloride of sodium; the silver at first darkens, sometimes approaching black, but in a little time the bleaching action of the chlorides begin to tell, and the negative becomes almost pure white. I have not found this to change in any light, or at all events, I may say I have seen positives whitened in this way, which have stood well for twenty years, with apparently little change. There does not seem to be any difference in action between the bromide of silver in the gelatine dry plate and the ordinary collodion wet plate. It is the silver which is altered, not the material which carries it, and so we must look to the varied combination of silver and of mercurial salts. As I said, they are mostly all fugitive. In some instances the addition of terchloride of gold or of platinum seems to give more perfection or stability of image; but, taking all things into account, I think the less we have to do with mercurial intensifiers the better.

Even in its metallic state—as, for instance, in the state of amalgam with tin, as in our ordinary mirrors—it is by no means permanent, as witness the effect of sunlight and its heat, or heat alone, on our ordinary mirrors—the result being a gradual sublimation of the more volatile metal, and a consequent spoiling of the mirror. My judgment, then, is that, except on the rarest emergencies, in all shapes and forms mercury should be excluded from photographic operations.

◆

SIZING PHOTOGRAPHS FOR OIL PAINTING.

BY THOMAS GULLIVER.

As a contribution to the varied articles in your columns I send the following, which has stood the test of many years' experience, and in my hands has proved better than glue, size, isinglass, and the several sorts of size sold for the purpose; it may be known to some, but I believe it not to be generally known. It is merely a solution of best gum-arabic; to make the solution take (say) two ounces best white gum-arabic, put it in a small gallipot, and just cover it with clear cold water; let it stand a few hours, add a little more cold water, then (say next day) use warm water until sufficiently liquid to flow nicely from the brush; filter it through a piece of wet muslin, made so by dipping the muslin in water and wringing it out; then add to the whole solution about a small tea-spoonful of finely-powdered alum, let it stand until clear, and it is then fit for use. It spreads nicely over the photograph. Using two coats gives a good surface to colour upon; it is always ready for use, and is useful in spotting out, and for many other purposes. It keeps well; I have some that was made eighteen months ago that is now as good as ever. This, I hope, may prove useful to some of your readers.

---

* Read before the Edinburgh Photographic Society.

◆

Correspondence.

BLACK STREAKS IN NEGATIVES.

Dear Sir,—Whilst pushing some plates along the glass table which I use for cooling my plates on, a few weeks back, I observed a streak of light flash from the edge of the table immediately beneath a plate which had stuck to the surface of the glass. A thought struck me, and I procured a few dried plates and rubbed along the edge, producing thereby a succession of sparks. On development I found the black lines in the exact spots where the edge of the table had been in contact with the plates when the sparks had been produced. Is not this the most probable cause of this frequent defect in many plates?—I am, sir, your obedient servant,

Actinic.

PACKING GELATINE PLATES.

Dear Sir,—Makers of the new gelatine dry plates should be cautious how they pack them. In conversation the other day with one of our principal men here, he mentioned a singular case of fog which had occurred to him. At one end of the plate was a wavy line of fog from an eighth to a quarter of an inch in depth, the top of the plate in the packages, and as it occurred whether he placed that end down or at the top of the slide, it was proof it was not the camera's fault. On examining the packing, he found that the shape of the fog coincided with the coloured (yellow, I think) paper used to keep them tight in the package. Now, the question is, was the fog produced from some chemical action of the colour, or had the paper in its colour absorbed sufficient light to produce the effect? The fog followed the line of the paper as it was pressed down between the plates.

Dunedin, New Zealand. A Subscriber.

INTENSIFICATION NOT REQUIRED IN DRY PLATES.

Dear Sir,—My process is not a secret, but very simple. Having worked dry plates for some time, and, like others, having tried a variety of makers, some good, and some bad, I have succeeded at last in producing negatives of first-rate printing quality without intensification. I now develop my plates with Edwards' formula, wash, fix (by pouring on the plate) with an old hyposulphite bath after having done its duty for fixing prints, and well wash. The colour will be all that is required—shadows transparent, and with sufficient density. I leave for wiser heads than mine to give the reason, but should think the richness of the negative arises from the gold and silver left from the prints in the hyposulphite fixing bath.—Yours,

H. D.

INTENSIFYING GELATINE PLATES.

Dear Sir,—In the issue of the 18th November last, of your excellent journal, there is a note from "Intensifier," who desires to know a method of restoring yellow *clichés* that have been treated with Edwards' intensifier. I have experienced the same inconvenience with Mr. Edwards' solution, but I manage to restore my negatives most perfectly in the manner following.

The yellow *cliché* is put into hyposulphite solution of one or two per cent. strength until all yellowness has disappeared; it is then washed and plunged in a bath of bromide of ammonium until the *cliché* bleaches slightly; I then wash again, and immerse it for three minutes in an oxalate of iron developer. Finally, I wash again, and intensify with bichloride of mercury and ammonia. If you have intensified too much, reduce by by the Cowell solution (citric acid 2, alum 1, water 30).

I send you herewith an impression from a *cliché* treated in the manner I have indicated.—Will you accept my salutations, &c.,

D. A.

Cadiz, the 11th of December, 1881.

[The picture forwarded is exceedingly clear and bright.—Ed. P.N.]

◆

Proceedings of Societies.

Edinburgh Photographic Society.

At the second ordinary meeting, held in 5, St Andrew Square, on the evening of Wednesday, 7th inst.—A Craig-Christie, Esq., in the chair—the minutes of previous meeting having been read and approved of, the following eight gentlemen were unanimously elected ordinary members:—Messrs James Wood, William M'Ghie, William W. Macfarlane, James Balmain, James Fleming, Alfred M. Palmer, John M'Kean, Joseph Cox.

Mr. Bashford proposed that a sum of money be devoted to the offering of prizes, open to the world, for the best photographs suitable for presentation prints, the prize prints to be distributed among the members of the Society.

The motion was seconded by Dr. Hunter, supported by Mr. Annan, and unanimously adopted.

Mr. Davies then continued the discussion on Mercurial Intensifiers (see page 610).

Mr. Asher corroborated Mr. Davis's statements as to the uncertainty of the results obtained by mercurial intensification, as though he had many hundreds of negatives taken seventeen years ago that had undergone no change, yet some had faded, and others had got hard. He had found the best preventive of the latter evil to be the addition of a small quantity of chloride of gold to the mercury; indeed, so satisfactory did he deem this in its working, that he always used it to intensify his wet plates, but for dry-plate work he always used Edwards' intensifier.

Mr. Crighton found that after using Edwards' formula some of his negatives turned quite yellow.

Mr. Mathuison applied ammonia after the mercury, and generally found this to answer, though not invariably.

Mr. Turnbull said it was always best to avoid the necessity of intensifying if possible, but when necessary he preferred to use iron and silver to bring up the density, which in his hands was always successful.

The attention of the meeting was next engaged in watching the exposure and development of bromo-argentic gelatine paper, Mr. Crooks printing by contact, and Mr. Turnbull enlarging by means of the Sciopticon, both developing with ferrous oxalate—the former adding a little KBr, while the latter omitted it. Mr. Crooks' prints proved correctly timed and satisfactory, while Mr. Turnbull's were rather over-exposed. The demonstration was watched throughout with much interest. Several members agreed with Mr. Turnbull that better results were obtained by using the simple ferrous oxalate, while Mr. Pringle found that by "sticking close to the published formula the best results were got." He found that by using less iron he obtained a better tone, whether with or without bromide; but the most important matter was to hit the correct exposure. In his own practice he preferred daylight—he found it an easy, inexpensive mode of getting a good enlargement.

Mr. Mitchell preferred alkaline development for the particular make of paper he used, although it sometimes left the paper with a stain that was not apparent during development; but the faintest tint was always fatal to the finished print. He found that while citric acid reduced the stain, it did not remove it.

Mr. Wane had used the paper to secure proofs for a customer who was leaving the town, and not being approved of, he was able to take another negative. The enlargements served admirably as guides for an artist, and they were also very suitable as foundations for crayon work.

The Chairman, in tendering the thanks of the meeting, said he considered the process might be available to scientists in many ways. He had no doubt that the microscopist would find the process an immense power in his hands.

Mr. Mathison exhibited a beautiful series of lantern transparencies, printed on gelatine dry plates. The prints were from his own admirable negatives, were of good tone and quality, with peculiar translucency in the high-lights, showing that the gelatine plate, as made by himself, is well adapted for lantern work.

Mr. Robert Murray, C.E., exhibited a series of splendid views taken during the last summer by the old coffee process. They were all brilliant, and many were exquisite in tender detail. Several members expressed their admiration of the pictures exhibited, but owing to the lateness of the hour many were unable to do more than merely glance at them.

The Chairman, in conveying the thanks of the meeting to Mr. Murray, expressed the hope that another opportunity would be given to the members of studying the pictures more closely.

It was arranged that the next ordinary meeting would be held on Tuesday, the 10th January, 1882, instead of Wednesday, the 11th, which was fixed on for the Society's first "Popular."

A vote of thanks to the Chairman terminated the proceedings.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting was held in the College of Physical Science, on Tuesday evening, December 13th, Mr. James Downey in the chair.

The minutes of the last meeting were read and confirmed Messrs. R. S. Freeman, James Gray, and George Bowers were nominated for membership, and Mr. George Stewart was elected a member. The nominations were then made for the next Council to be elected in January.

Mr. J. P. Gibson read a paper on "Lightning Photography" (see page 609).

Mr. Dodds moved, and Mr. Payne seconded, a vote of thanks to Mr. Gibson for his interesting paper, which was carried unanimously.

An exhibition of lantern transparencies, which was followed by a large display of photographic prints, brought the meeting to a close.

THURSDAY EVENINGS FOR PHOTOGRAPHERS.

At the meeting held on the 15th inst., the chair was occupied by the Rev. L. Macdona, B.A.

Among other proceedings, a series of experiments were made with a background coated with Balmain's luminous paint, sent by Mr. Bolas. A sitter having been placed in position in front of the background, the gas was lowered and the background excited with magnesium wire, the result being that the portion of the background where the shadow of the sitter was thrown remained unexcited; the sitter then moved away and plates were exposed on the screen. The second experiment consisted of exciting the background as much as possible, and then placing a sitter in front and exposing a plate on him for about ten minutes; the only light used for the two exposures being that given off by the screen itself.

Several pictures were then taken by means of the magnesium light. There were several cameras at work, and very good results are stated to have been obtained. The results on plates exposed by Mr. Henderson were excellent, especially the one taken of the sitter in front of the fully-excited screen, which showed the great luminosity of the paint.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society took place on Thursday, December 8th, 1881, Mr. Leader Williams, Manchester Institute, C.E. (President), in the chair.

The minutes of the previous meeting were read and passed, after which the following gentlemen were duly elected members of the Society:—Messrs. Edmund N. Ashworth, Max Baerlein, John Brier, junr., W. Kettle, F. G. Rowson.

The President then read a paper from Mr. Harding Warner, who was unable personally to attend.

A vote of thanks was awarded to Mr. Warner.

Mr. J. J. Taylor, a gentleman who had lived some considerable time in New Zealand, and who was a successful amateur photographer, exhibited a large collection of photographs, some of which were taken as long as ten years ago; and he explained many of the difficulties a photographer had to battle with in that country. The photographs were all from wet collodion negatives, of which great admiration was expressed, and a cordial vote of thanks passed to Mr. Taylor.

Mr. William Blakeley exhibited a very interesting photograph of the late Exhibition, taken by ordinary gaslight.

A vote of thanks to all the contributors to the late exhibition was carried with acclamation, and the proceedings then terminated.

Talk in the Studio.

A New Album.—Messrs. Marion and Co. are good enough to forward us a magnificent specimen of what they term the "Renaissance Album." The most valuable feature is the fact that the ornamentation which acts as frame-work to the portraits is dark and subdued in tone, and consequently will add effect to the photographs. As a rule, the ornamented albums hitherto issued have exerted just the contrary effect. The designs extraordinary, and vivid colours to be seen inside most of them, combine to degrade even the brightest photograph, and in any case the modest little brown portrait always seems out of place surrounded by gaudy decorations of bright scarlet, blue, and yellow.

A Camera for Wet or Dry Plates.—Mr. Francis S. Beatty, of Dublin, whose name is well known as one of the earliest photographers, has brought before the Photographic Society of Ireland an ingenious camera for working wet and dry plates, either in the field or studio. The camera is the subject of letters patent.

The Forthcoming Technical Exhibition.—We learn that the prospects of the Technical Photographic Exhibition organised by the Society of Arts are promising. Not only have most of the principal makers of apparatus already stated their intention of taking part in it, but the Secretary of the Society has also received promises of help from numerous professional photographers, amateurs, and experimentalists who possess specimens illustrating processes which are now practically forgotten; and we may therefore look forward to an interesting collection of historical specimens. Examples of most of the reproductive processes are also expected, and various appliances illustrating the diverse applications of photography to other sciences. The 7th of next month is the day fixed for sending in formal applications for space.

To Correspondents.

Young Excelsior.—1. It is always slow in the case of dilute solutions, especially when organic matter is present. 2. You might find it advantageous to use less hydrochloric acid, a little experience serving to indicate how much should be allowed for each sheet of paper.

E. T. Watson.—We presume you refer to Mr. Tuohy, of Richmond.

S. S.—Shellac may be readily dissolved in hot water to which a little borax has been added.

Northumberland.—1. The following are among the principal causes. The rising of damp from the footings, or those parts in immediate contact with the earth. 2. Leakage or overflow of gutters or pipes. 3. Penetration of rain from outer face, owing to the porous nature of the materials. 4. The presence of some deliquescent salt, as, for example, nitrate of lime. The remedy you propose might be useful in the third case, but the material should be put on the outside, if you wish to keep the wall dry. When the damp rises from the footings, a layer of slates laid in Portland cement should be inserted near the bottom; we have used old glass plates instead of slates, and found the result most satisfactory. Common sense will indicate the necessity of only operating on a small portion at a time. 2. Most likely it would. 3. Probably not.

S. A. G.—1. It is quite useless to work under such conditions, and if you had followed your friend's excellent advice, the difficulty would not have arisen. 2. A saturated solution of common alum (this may be either potash or ammonia alum, both being sold indifferently) in cold water. 3. See our advertising columns. 4. The active constituent is sulphide of sodium.

J. J. Dickinson.—Thanks. It seems a little complex in its action, but we will make a model and try how it works.

Mc I——.—It is one of the most fugitive red colours known. 2. The probability is that the instrument is not materially injured; but you had better paint over the damaged parts with black varnish

Discouraged.—Undoubtedly due to insufficient washing.

Nemo.—The nitrate is about six times as soluble as the sulphate.

J. T. Carter.—You have been made the victim of a practical joke.

Thomas Biden.—It is not usual to give a contributor's address under the circumstances; but if you will send the letter to us, we will forward it.

THE PHOTOGRAPHIC NEWS.

Vol. XXV. No. 1217.—*December* 30, 1881.

CONTENTS.

PAGE
Halation ... 613
On the Drying of Gelatine Plates... 613
Enlargements on Gelatino-Bromide Paper... 614
French Correspondence. By Leon Vidal ... 614
Halation. By Captain Abney, R.E., F.R.S. ... 615
Notes... 617
Topics of the Day.—My Studio—An Ow'r True Tale. By an ex-Photographer. ... 618
Dry Plates, Dark-Rooms, and Printers. By George Bradforde 619
On the So-Called Crystallization of Varnish. By A. J. Brown 620
An Improved Sensitometer. By J. D. Mucklow, F.I.C., F.C.S., and J. B. Spurge ... 621
Coloured Transparencies from Silver Images. By C. R. Woods 621
Keeping Emulsion. By Archer Clarke... 622
How to Make a Cheap Folding Camera Stand. By Kenneth Bean ... 622
Correspondence ... 622
Proceedings of Societies ... 624
Talk in the Studio... 624
To Correspondents ... 624

HALATION.

We print in this number of the News a most interesting paper by Captain Abney on "Halation." In this article he shows—as he has done several times before—that halation is due to reflection from the back of the glass plate, and chiefly reflection at the critical angle, the reflected light having been "scattered" by the particles of silver salt in the film. This view is identical with our own, as we have frequently expressed it; that is to say, that reflection accounts for the greater part of halation.

We took occasion to point out also a short time ago that, besides the halation produced by reflection from the back of the glass, there is a small amount caused by the want of transparency or the turbidity of the glass; in other words, there would be a certain amount of halation if a glass plate of infinite thickness could be used. Of course we cannot use a glass plate of infinite thickness, but the following experiment will prove what we state.

Take a piece of glass several inches thick—the best thing to use is one of those large cubes of polished glass sold as letter-weights—cover five sides with some backing having a high refractive index: carbon tissue moistened with glycerine will do. Sensitise the sixth side with gelatine emulsion. Wrap the whole in tin-foil, and make a small aperture, either round or otherwise, in the tin-foil opposite the sensitized side. Now expose to artificial light for a considerable time, allowing the light to fall either at right angles to the sensitized surface, or obliquely. If the exposure have been long enough, halation will make its appearance on development. This halation will not be in the form of a ring separated from the central spot, but will form a halo extending to some distance from it.

The exposure must undoubtedly be considerably protracted before the halation described will make its appearance, but we must take into consideration how *very* protracted the exposure of some parts of a plate may be in practice in certain circumstances. For example, suppose the case of a somewhat dark interior with a small window in the upper part showing sky. Let sensitive gelatine plates be used, and an aperture of $\frac{f}{30}$. The small spot of sky would probably be fully exposed (that is to say, would come up to opacity on development) with two or three seconds of time; whilst to bring out all detail in the interior might require one or even several hours. Long before this time halation, due to turbidity of the glass, and which could not be prevented by any backing, would have made its appearance, in addition to halation due to reflection from the back of the glass, which, as we have pointed out, can be prevented by backing with a substance having about the same refractive index as glass say bitumen.

We stated, too, in our former article that the only means of preventing the former kind of halation is to use some colouring matter either in the film or between the film and the glass. We suggested iodide in the emulsion. We are well aware that both iodide and dyes in the films have often been suggested before. But the chief object in our former article was to point out that the *only* way to prevent *all* halation, which is principally due to reflection from the back of the glass, but partly to other causes, is to prevent any actinic light from reaching the glass.

◆

ON THE DRYING OF GELATINE PLATES.

It is now quite a recognised fact that, for the drying of gelatine plates on any scale above an experimental one, some special box or room is necessary. Given this, the only thing required to ensure the desiccation of the films is a constant current of dry air at a moderate temperature. From 60° to 65° Fahr. is about the best; this will bring about the desired object in a time varying from a few hours to a few days, according to the dryness or the reverse of the air, and the thickness of the films. As the fact becomes more and more appreciated that the image, in the case of the gelatine plate, is in the film, not on it, so it becomes evident that, to have command of the full qualities of an emulsion, it is necessary to have a thick film. For this reason, the coating of plates very thickly gains ground, and the time taken to dry the plates increases until—especially in cold weather, and where artificial heat is not used—it becomes excessive.

It will be recollected that, a short time ago, we described a neat method of drying a few plates rapidly and well. It consisted in taking an ordinary band-box, and thoroughly desiccating the wood of which it is made by placing it in front of the fire, of afterwards placing the plates in it, and enclosing the whole in a tin box.

This method is very well suited for drying a few plates, such a number, for example, as might be used for experimental purposes; but it is evidently inapplicable to a large number. We propose, however, to describe a modification of this plan, or, rather, a means of applying a somewhat similar principle, to the ordinary drying-box, which will be found to very much facilitate and shorten the process of drying a number of plates.

We shall suppose any of the usual forms of drying-boxes, in which the plates are rested either in racks or on wires, to be used, and in which air is caused to circulate by inducing a current in the exit pipe by a gas-burner or by any other means—in fact, any kind of drying-box, except that in which there are numerous horizontal shelves, with the current of air drawn first along one, then along another.

Procure a mass of iron, either cast or wrought, weighing five or six—or, if you like, more—pounds. Heat this in the kitchen fire, and about an hour before the plates are to be placed in the drying-box, place it red hot on a brick lying on the floor of the box. A suitable piece of iron may be picked out of the "scrap heap" at any iron works. When the hot iron is in the box, light the gas, which induces the current. When the plates are ready to go into the box, remove the iron; they will dry in about half the time which they would otherwise take.

It must be understood that the object is not to heat the plates, it is simply to thoroughly desiccate the wood of the box by radiant heat from the hot iron. When this is done the wood has such a powerful attraction for moisture that it dehydrates the air in the box, and causes the water to evaporate rapidly from the plates.

It is quite essential that the current of air should be passing through the box whilst the hot iron is in it, otherwise the only effect of the iron will be to cause the wood of the box to "sweat"—that is to say, the heat will have no other effect than that of making the moisture which is in the wood evident, instead of carrying it away.

The advantage of the hot iron over any other form of heating apparatus is that it gives off heat without giving off any products of combustion. The burning of a Bunsen burner, for example, in a box would probably result in making it, after it cooled down again, somewhat damper than it was before, because water is one of the products of the combustion of coal gas.

Of course the total desiccating powers of a certain amount of wood is limited, but in an ordinary wooden box, if it be not packed very full of plates, there will be enough of "desiccating surface" to have a very marked effect in the drying of the films.

We need scarcely say that where the box is so small as to be easily carried, and is not fixed, the same object as that described above may be brought about by warming it up in front of a good fire.

ENLARGEMENTS ON GELATINO-BROMIDE PAPER.

An old friend of ours, an artist, who never loses an opportunity of visiting the Photographic Exhibition, described to us some platinotype pictures recently exhibited as beautiful imitations of steel engravings, and we venture to think that a good enlargement on gelatino-bromide paper approaches them as closely.

The ease and simplicity of the process, and the beauty of the results, can only be thoroughly appreciated by those who have worked at it; and, although the process is rapidly finding favour with professional photographers, we hardly think that amateurs are giving as much attention to its study as it deserves.

We had the privilege, some little time ago, of visiting Messrs. Morgan and Co.'s establishment at Greenwich, to whom is due at least the credit of bringing the process into commercial use. The possibility of coating paper successfully with a gelatino-bromide emulsion has, of course, been familiar for a long time; but, although it has been discussed at various times, it had never passed much beyond the experimental stage until introduced by the above firm. Mr. Morgan uses artificial as well as day light for his enlargements, and it will be within the recollection of our readers that this gentleman demonstrated, at a meeting of the South London Photographic Society, a method of enlarging by means of a paraffin-lamp contained in an ordinary biscuit-tin, a 4½ or 5 condenser being used to concentrate the light on to the negative.

At the meeting of the Liverpool Association in September, the Rev. H. J. Palmer described the method that he employed, which appeared to be identical with that shown by Mr. Morgan. The practice of enlarging by daylight is necessary when negatives of a larger than quarter-plate size are being employed, as the cost of condensers to cover a half-plate is a very serious item.

Any convenient room can be used for the purpose of enlarging, by covering the window and cutting a hole in the covering large enough to admit the negative. A camera is set up in the rear of the negative, and the picture focussed on to a sheet of cardboard, set up parallel to the negative. The space between the negative and the lens must be rendered light-tight by means of a sleeve of black twill or other opaque substance. The camera should have a rising front, so that the picture can be adjusted accurately in position on the screen. The paper can be simply pinned to a board and substituted for the focussing screen; but in our own practice we always prefer to soak the paper, film side downwards, in a dish of water for a couple of minutes, and then lay it on a sheet of glass of the same size as the focussing screen. The paper lies much flatter, and the required exposure is not affected, although care must be taken to drain the paper well before exposure. The latter is an item about which instructions are misleading; but to those who attempt the process for the first time, we may state that on a fine morning at this time of the year, and with an eastern aspect, such as our dark-room possesses, we give about three minutes' exposure in enlarging a negative to double its dimensions with a rapid rectilinear lens of a focal aperture $\frac{f}{12}$ A small amount of practice is better than many pages of instructions, and a few failures will be of more assistance than the same number of successes. The picture should be developed with plain saturated solutions of potassium oxalate and ferrous sulphate. The use of various other ingredients has been proposed, as well as the ordinary alkaline development; but in our opinion they add to the difficulty, without in any way improving the results. Saturated solutions of ferrous sulphate and potassium oxalate in the proportions of one to four, restrained with potassium bromide, constitute an extremely rapid developer, giving the purest blacks in the shadows, and white paper in the light, a result which does not invariably obtain when alkaline pyrogallic development is employed. The more contrast and density in the negative, the less restraint is required, and *vice versa*. The development of the print should always be stopped slightly before the desired density is attained, as the shadows darken in fixing. After thorough washing, the prints should be soaked in water containing about three per cent. of sulphuric acid. This quantity of acid will usually be found sufficient to dissolve away any slight discolouration due to development. The prints may, if desired, be still further improved by enamelling or use of encaustic paste.

FRENCH CORRESPONDENCE.

Regulations for the Examination of Photographic Assistants—Experiments with Amalgamated Zinc—Process for Copying with Sulphide of Calcium—The Application of Photography to the Decoration of Porcelain—Good Wishes for the New Year.

Examination of Photographic Assistants.—At their last meeting the *Chambre Sindicale de la Photographie* adopted a code of regulations[*] for the conduct of the examinations of photographic assistants; each paragraph was discussed and voted separately. As the examinations will be open to any one conversant with the French language, they may have an international character. The object of the promoters is to provide those who pass these examinations with something in the shape of a diploma which shall be an official guarantee of their capabilities, both in the theory and practice of one or more branches of their profession. Of course this diploma will not be sought after by all who desire to become technical photographers, but for those who do obtain it, it will be a certificate of ability which must go a great way to secure them employment in studios where skill and intelligence are valued, for firms who desire to maintain their reputation for good work will naturally be anxious to secure the services of a certificated operator. Without being difficult, the examinations will be thorough, so that no one who does not possess more than an ordinary knowledge of his profession will be able to pass them. So soon as the syllabus is published, I shall take care to send it to the Editor of the Photographic News for the information of my readers.

---

[*] Our esteemed correspondent has sent us a proof copy of this programme, and we shall take an early opportunity of reproducing it for the benefit of our readers.—Ed. Photographic News.

Experiments on Amalgamated Zinc.—M. Fisch has been making some very interesting investigations on the use that can be made of amalgamated zinc. The property of an amalgam of zinc and mercury to repel fatty ink is already known, so that if lines be traced with mercury on a zinc plate, and an inked roller be passed over it, the drawing will not take up any of the ink. If, instead of inking the plate, a very dilute solution of nitric acid (2 cub. centim. of acid in 100 grammes of water) be flowed over it, the amalgam is dissolved, and the lines consequently are etched in; on the contrary, if hydrochloric acid is used, the amalgam is not attacked, but the zinc is dissolved, and the lines are left in relief. Now, proceeding on these principles, let us coat the surface of a zinc plate with some photographic preservative medium, such as bitumen of Judæa, or bichromated albumen; the parts where the metal is exposed can then be acted on by mercury, either in a liquid state or in the form of a solution of a salt of that metal (like the biniodide), and will be converted into the amalgam, which can then be treated so as to produce the image either in relief or in etching, as may be required. Another method of procedure would be to take a copy of a line drawing by the gelatine process, and then dusting the image, while still in a humid state, will produce biniodide of mercury; this, when dry, would then be applied to a plate of zinc, and a copy of the image would be produced on it in amalgam. By then plunging the plate into a bath of nitric or of hydrochloric acid, as before, the image will be obtained either in relief or engraving.

Copying Process by Sulphide of Calcium.—There is a similar process by means of which a series of copies of a line drawing may be taken in metal plates. An image is taken by what is called the dusting-on process, and finely-powered sulphur or calcium sulphide is used. Now, if a plate of silvered copper be applied to this image for a short time, the sulphur will attack the silver, and an image of black silver sulphide will be formed on the plate. By this means a number of identical copies on silvered plates may be taken, without having recourse to the action of light. A copper plate can be readily and economically silvered by means of the silvered cyanide.

The Application of Photography to the Decoration of Porcelain.—I have just returned from Limoges, to which place I had been sent by the Ministry of Fine Arts to deliver a course of lectures at the International School of Decorative Art on the possible application of the different photographic processes to the decoration of porcelain. The porcelain painters at Limoges have not yet got beyond the use of chromo-lithography and copper-plate engraving for producing drawings and pictures to decorate their plates, cups, vases, &c. Not one of the printing processes known as phototypie, Woodburytype, or heliographic engraving is in any way familiar to them. My lectures, therefore, obtained an amount of success which I was far from expecting. Numerous experiments are at once commenced on the lines which I had indicated, and I have no doubt that in a short time the industry of porcelain painting will have undergone considerable modification, and the process be much improved.

Good Wishes for the New Year.—As this will be the last time in the present year that I shall pen a letter for the Photographic News, let me take the opportunity to transmit to all my readers my best wishes for a happy new year. The art of photography is so rapidly moving in the path of progress as to hold out the best hope for an abundant and rich crop of valuable improvements and interesting discoveries during the year 1882. My task will be to follow closely the movement of our art along this path, and to keep my readers on the other side of the Channel *au fait* with all the new and important work which is produced in this country.

Leon Vidal.

HALATION.

BY CAPTAIN ABNEY, R.E., F.R.S.*

Though the subject has been treated of by me before, I yet have thought it might be well if the subject were brought before the Society in order to create a discussion, if possible. The latest theory—which is not new, by-the-bye, for I recollect Mr. Warnerke propounding the same explanation—is that it is caused by the dispersion which takes place in the glass on which a negative is taken—that is, that the rays of light, having traversed the film of sensitive salt, are dispersed by the motes, not in the air, but in the glass. In a recent communication to one of the weekly photographic journals I have combated this idea by proposing some experiments, and I have thought it well that the results of such experiments should be seen. On the first plate I show there are various figures cut in tinfoil—a triangle, a slit, a small circle, a dot, a cross, and a square. This was used as a negative from which to take transparencies. A gelatine film on glass ⅛ inch thick was placed in contact with the tinfoil, and exposed to light for a brief period. The gelatine plate contained silver bromide only. On development these figures were seen surrounded by halation. A selection of these are given in the following diagram:—

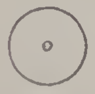


Fig. 1.

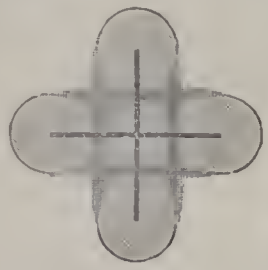


Fig. 2.

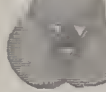


Fig. 3.

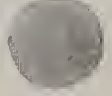


Fig. 4.

I would call attention to the fact that all the figures of small sectional area are bounded by exterior lines. We get the same result, though somewhat less marked, with a collodio-bromide film. The film being orange-coloured by transmitted light, it naturally allows less of the chemically active rays to pass. I would next show the effect of increasing the thickness of the glass. It will be seen that the haloes recede from the central figures, showing that the thickness of the glass has something to say to the dimensions of the halo (see figs. 5 and 6). Let us pay attention, first of all, to the circle surrounding the dot, and from that we shall be able to build up the other figures; and subsequently I will explain how the ring is obtained. I will first, then, suppose it admitted that, by exposure of the dot on the tinfoil, an image of the dot is obtained, together with a fainter ring surrounding it (as in fig. 1). Let us next see how this affects the image of the line.

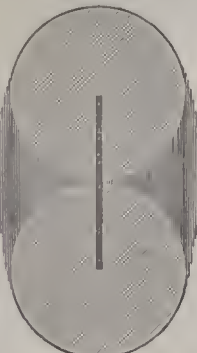


Fig. 5.

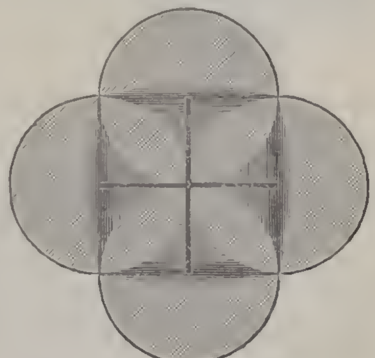


Fig. 6.

If we suppose the line to be made up of a succession of dots, we shall find at the two tangents of the circles surrounding these dots, and parallel to the line that owing to the overlapping of the circles, the greatest blackening would be shown the ends, of course, would also be bounded by a semicircle (see fig. 7). If we

---

* Read before the Photographic Society of Great Britain.

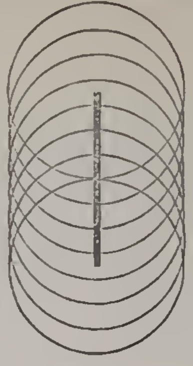


Fig. 7.

apply this to the cross, we find that we get two such figures (Fig 5) intersecting one another (see Fig. 2 and Fig. 6). If the same argument be applied to the triangle, which is of small dimensions, we shall find the shape of the halo shown in Fig. 3. When we come to the square and circle, by applying the same reasoning, we shall find that, owing to the *size of the areas* (which may also be presumed to be made up of dots), the overlapping circles give halation extending to the central image.

Now let us see whether this ring round the dot (Fig. 1) can be due to the glass itself. Supposing light were scattered by the glass, even if it were a really turbid medium, the ray which would have the greatest intensity would be in the direction in which the light fell on the surface, and in no other direction. The general effect of such halation would be to give a diffused image from reflection from the back of the plate: a dot, for instance, would appear very much as it would if it were photographed out of focus, having a defined neutral nucleus, as would also the other figures. Certainly no such effect is found in practice. Perhaps the best example of turbid glass is to be found in opal glass. In this case, and in case of ordinary glass, the diameter of the motes is comparable with the wave-length of light, and hence cannot scatter light geometrically, and, if few in number, could only cause an inappreciable deviation, amongst other things, in the path the rays take. In the opal glass the motes are so numerous, that the deflection and consequent reflection have to be taken into account, and we get the figure shown in (Fig. 8.)

Fig. 8.

Fig. 9.

Suppose, however, light be scattered by particles of definite size—that is to say, appreciable size, and such as are to be found in the sensitive salt in the film—it would be reflected in definite proportions in all directions. The following is from a paper which I wrote in 1875 to the "Philosophical Magazine:"—

"It is these small particles that cause the film to be translucent and prevent its being transparent. Where there is translucency there must be a scattering of the incident rays

These particles are quite measurable; hence we cannot treat the question as if they were small fractions of a wave-length. In fact, they are several times larger in diameter than the greatest wave-length: and as we have to deal with the smaller wave-lengths, we may treat the question as a case of simple geometrical reflection. At any rate, the dispersion caused would not interfere with the general result.

The physical forms which the particles take are not quite parent. Being in an amorphous state, it will not be unfair to ssume that they are generally of the shape of a spheroid. For the sake of calculation we may also assume that each particle reflects a definite proportion of light. This hypothesis will be found not to affect the aspect of the problem if the refracted rays be traced after transmission through the sphere in a similar manner to that in which it is proposed to trace the reflected rays. In any case, it is only assumed that an approximate solution can be obtained.

Let us consider the action of one particle, and, for the sake of simplicity, let us take it to be one in contact with the surface of the glass plate on which the film rests. The case where the minimum irradiation will be produced is that in which the incident ray falls perpendicularly on the surface. First, on these hypotheses, let us examine the intensity and direction of the light that would fall on the plate.

"As the general direction of the light is perpendicular to the surface, it is evident that by far the largest proportion of it must fall in the same direction on the particle under consideration.

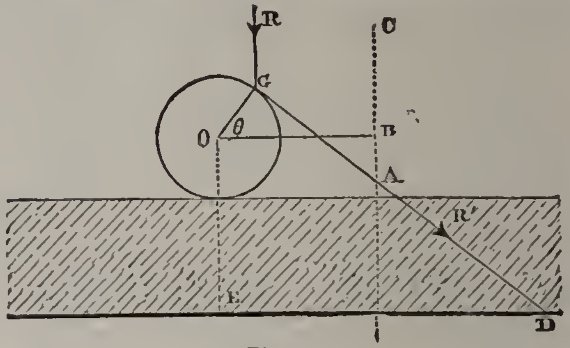


Fig. 10.

"Let r = the radius of the particle.

"θ = the angle of incidence of R, a ray of the pencil falling on it.

"Let A E represent a section of the glass plate.

"Let [*] E D = x, and t = thickness of the plate.

"Since E G D = 2θ,

$$\therefore x = r\cos\theta + (t + r + r\sin\theta)\tan 2\theta.$$

"From the question before us it is manifest that θ cannot be greater than $\frac{\pi}{4}$.

"When r is small in comparison with t,

$$x = t \,.\, \tan 2\theta,$$

$$\frac{dx}{d\theta} = \frac{2t}{\cos^2 2\theta}.$$

"Now the quantity of light falling upon a very small surface at G will be distributed on a small surface about D.

"The small surface at G may be represented by

$$r^2 \sin\theta\cos\theta \,.\, \delta\theta \,.\, \delta\phi$$

(where ϕ is the angular measure taken parallel to the surface of the plate).

"The small surface at D will be

$$\chi\delta\chi \,.\, \delta\phi = t \,.\, \tan 2\theta \times \frac{2t}{\cos^2 2\theta}\,\delta\theta .\, \delta\phi.$$

"If I and I' be respectively the intensities of the light reflected from G and falling on D,

$$I'' = \frac{Ir^2 \sin\theta\cos\theta}{2t^2 \, \frac{\tan 2\theta}{\cos^2\theta}} = \frac{Ir^2}{4t^2}\cos^3 2\theta.$$

"Since $x = t \,.\, \tan 2\theta$,

$$I = \frac{Ir^2 t}{4} \cdot \frac{1}{(t^2 + \chi^2)^{\frac{3}{2}}}.$$

"For the sake of illustration the accompanying curve has been constructed, showing the general relation between the intensity and angle of incidence on the bottom surface of the plate. The ordinates represent the intensities. For the abscissæ the thickness of the plate has been taken as the unit of measure.

"The solid of revolution formed by the area rotating round the axis of y would give the projection of the pencil of rays incident on the particle multiplied by its intensity. Not all these rays will be reflected back; only those which fall at and beyond the critical angle will do so. Calculating according to Fresnel's formulæ[†] the amount of light that would be reflected for each angle less than the critical angle we get the curve which bounds the shade part of the figure. (The intensity of the light reflected is represented by the height of this shaded curve.)

---

[*] "The refraction-index of collodion and the glass may be taken as equal."

[†] The light polarized in one direction alone has been calculated. If the other component had been added, the rapid increase in reflected light would have been only more apparent.

The area between the two curves shows the amount that would pass through. The refractive index has been taken as 1·5.

"An examination of the figure shows that if a ray of light fall on the film, on development a ring *might* be formed round the image at a distance from it equal to $2t \cot \chi$, where χ is the critical angle; on the inside it would be shaded off more abruptly than on the outside. If then a cylindrical pencil of rays were to fall on a film, a similar detached annulus would result, provided the diameter were $< 2t \cot \chi$."

Now this is exactly in accordance with the actual results, substituting a physical dot for a merely mathematical one; and since experiment and theory corroborate one another, we take it that this is the true theory of halation.

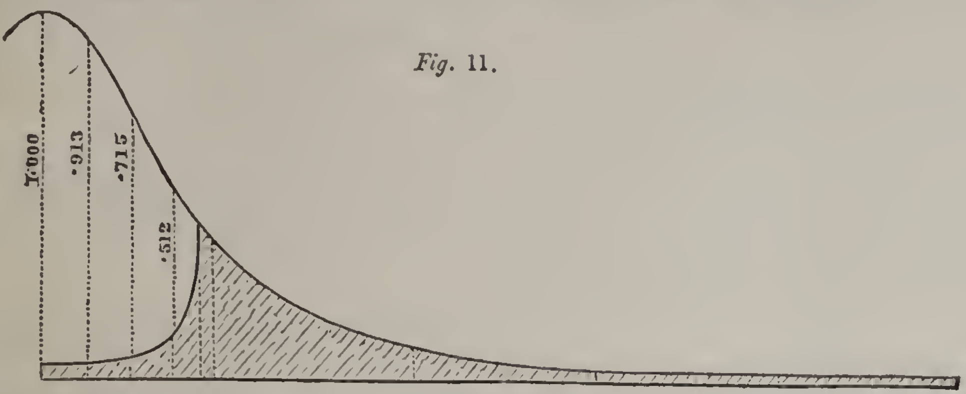


Fig. 11.

Were it necessary to show further the accuracy of the deductions, it is only needful to prepare plates by the bath and with albumen, and to treat them as I treated the emulsion dry plates. These are nearly transparent, and it will be found that with such it is very hard indeed to obtain halation at all. When a film is of a ruby colour, and thick, the same difficulty is met with in getting halation, since the light that passes through the film is of such a colour as to be non-effective on the film, and so, though reflected, it does not make an impression. The use of iodide in a gelatine film helps this colouring of the film. I show one plate pure bromide, and the other bromide and iodide mixed; and it will be seen that the blue-grey coloured light transmitted by the bromide, causes the haloes, whilst with the bromo-iodide it is very much reduced in quantity.

It is interesting further to show the effect of the total reflection of the glass plate, by placing a second plate behind the first plate, to catch up the rays that pass through the latter. If the plate be separated by the thickness of a ferrotype plate, we get the Fig. 9. If the exposure be very prolonged, this in its turn is surrounded by a halo, but is not present with ordinary exposure. I next tried the effect of ground glass, coating the smooth surface with emulsion. The effect was to make for the cross a central square, and for the dot a diffused halo. The critical angle of the glass could still be traced, but not markedly. When a plate is coated back and front with emulsion, and both sides developed, or if a second collodion emulsion film be pressed in contact with the back of the plate, the critical angle is not marked. For example, the cross, when viewed by transmitted light, presents much the appearance of Fig. 8. If the collodion film at the back of the plate be scraped away from the images, it will be seen that the figures are sharply defined, with a slight halo round and touching them.

When orange glass flashed on one side is used, and the unflashed side be coated, the figures are seen to be absolutely sharp, as is the case also when the back of the plates are coated with asphaltum dissolved in benzole.

The effect of backing is very well shown by coating the back of a plate with collodion containing eosine. Eosine allows some violet rays to pass through it, and hence when a surface of dyed collodion and glass are in contact, owing to the fact that reflected light has to penetrate a fraction of a wave-length into the former, those unabsorbed rays are reflected back, and we get haloes, as in Figs. 1, 2, 3, and 4, but fainter. If a plate be backed with turmeric dissolved in gum, we have a medium which absorbs all the chemically active rays, and we get a perfectly sharp image.

On the other hand, if we back a plate with damp, red blotting-paper, it will be found that the halation is only slightly inferior to that obtained on an unbacked plate, because the blotting-paper is not all over in optical contact with the surface of the glass. The same reasoning applies to powders brushed over the back in gum. They are, to a certain extent, effective, but not so greatly as when the gum absolutely dissolves it.

We thus see that there is a complete cure for blurring of the image, if proper precautions are taken.

In the cause of astronomical science, I am glad to have the opportunity of describing the effects of halation, as recently we have had an astonishing announcement made by a certain German Professor. He has stated, and has absolutely got the French Meteorological Office to believe him, that he has been able to photograph the solar corona—which, even during an eclipse, is photographed with difficulty—in full sun-light. I have had the advantage of seeing both the photographs and the drawings from them, and have come to the conclusion that what has been considered the corona is merely halation. When pointing a lens to the sun, according to the laws of optics, if the axis of the lens be not in a line with the solar disc, certain bright reflections are thrown by the surfaces of the lenses on to the plate below, and these have been called solar streamers, projecting through the corona. Had the Professor backed his plates with asphaltum, the corona would have disappeared, and he would have been left with his solar disc and its streamers; and if he had pointed the axes of his objective or reflecting mirror so as to be absolutely in the direction of the solar disc, I have but little doubt that the streamers too would have vanished.

Notes.

Why does magnesium wire go out continually on burning? "In a great measure," said Mr. Bolas, the other night at the Photographic Club, "because its surface is not bright. If you take the trouble to sand-paper the surface beforehand, the wire will burn regularly enough."

We may add to what we said last week about leaving your shadow behind you, that if, instead of a bit of canvas, paper—or, better still, canvas with a paper face—is used for the screen, then the luminous paint included among Judson's dyes may be employed. This is simply mixed with warm water and kept hot during its application. A bottle sold retail for eighteenpence will amply suffice for a two-foot screen, and will even cover two such screens with care.

The Transit of Venus that takes place next year has not raised the same interest as in 1874. The photographic records secured on that occasion having proved of little value, there is no likelihood of the camera again being brought into requisition. In fact, the expeditions undertaken to observe the phenomenon will be on a much more limited scale. Germany will spend but £10,000, instead of £30,000 as formerly, and it is questionable whether the British Government will contribute anything at all.

A happy idea. Mr. W. J. Wilson, who has been lecturing under the auspices of the City Guilds, employs photographic transparencies in a lantern in preference to diagrams, as being far less expensive. At the close of his last lecture, to impress upon his audience the Christmas recess, he exposed a lantern slide bearing the announcement in large letters, "Next meeting, January 16."

The stage of the Savoy Theatre was lit up by electricity for the first time during the performance on Wednesday afternoon. As far back as October we gave in these columns a full description of the new lights, explaining the way in which the Swan lamps were arranged for footlights, battens, and wing-ladders, and how the illumination was very like the golden light of morning, without the least resemblance of that garishness so inseparable to gas.

We were present at the performance, and were gratified to find that the promise given at the first experimental exhibition in October was fully realised. We noted the temperature at the back of the dress circle, and found the thermometer registered 65° F., a most comfortable warmth. The actors in *Patience* to whom we spoke were quite ready to endorse the favourable verdict, and altogether Mr. Swan may be congratulated on a dramatic success without parallel.

Gas-fitters have recently made a most useful application of photography. They photograph the gas flames given by different burners or jets, so that a customer can see if the shape and form of a light will suit him before he gives his order. As the flames are, moreover, depicted "life-size," the purchaser can always tell whether his jet is up to the standard.

The lighthouse authorities, both of this country and France, have for many years past used photographs of flames—oil flames in this instance—for a somewhat similar purpose. The light-house keeper is enjoined to keep his lantern burning clearly and steadily from sunset to sunrise, and so that the full illumination of the lamps should be forthcoming, while they shall not at the same time be overtaxed, a photograph showing the exact size and shape of the flame is hung up in the lantern. The photograph is that of a lamp burning at its best; and with this standard before them, the lighthouse keepers have no excuse for showing a dim lantern.

Speaking of lighthouses, some discussion has recently appeared in our contemporaries as to the date when the electric light was first employed as a beacon. In England the first electric lighthouse was undoubtedly that at Dungeness, lighted by Professor Holmes, in 1859; but we remember to have seen in the winter of 1858-9 an electric light inside the lantern that stands at the head of the breakwater at Geneva; for Geneva Lake, it must be remembered, is fifty miles long, and is subject to exceedingly violent storms when the cold *bise* blows from the Jura range. The late Professor de la Rive, an electrician of world-wide celebrity, had the care of the Geneva lighthouse.

Dr. Hermann Fol, of Geneva, writes:—"I have followed out Dr. Eder's formula for making gelatino-chloride, and to my great delight it has succeeded most perfectly in my hands."

We are glad to say that the fine collection of gelatino-chloride transparencies we saw at Vienna, showing a wonderful range of tone and colour, is now in London, and will shortly be exhibited.

The Photographers' Benevolent Association is evidently getting on; we hear there is upwards of a hundred pounds standing to its credit at this moment at the London and County Bank.

There has been the usual supply of gorgeous Christmas books this year, but we have not seen a single volume among them illustrated by photography. What are photographers and publishers about?

A correspondent sends us a way of testing instantaneous shutters. Focus some dark object, such as a house, brick wall, &c., put in your plate, and make ready; then let an assistant throw up a stone tied in a white pockethandkerchief, and while this is in mid-air, take its picture. Our correspondent assures us it is a very easy feat with any good shutter.

Topics of the Day.

MY STUDIO—AN OW'R TRUE TALE.

BY AN EX-PHOTOGRAPHER.

Exultant and glad am I to be able to thus sign myself. How did it happen I went into photography? I drifted into it, as I suppose hundreds of other men have done. The wonderful achievement, when of tender years, of constructing a camera out of a cigar-box with a double convex lens, costing eighteenpence, followed by the purchase of a complete set of apparatus for twenty shillings, had fired me with the ambition to become a professional photographer; and accordingly, in the process of time, I saw myself the proud possessor of a studio, and waiting (I can't say patiently) for sitters. That studio was at once a thing of joy and of dread. It was none of your make-shift glass buildings, poked in some out-of-the-way corner on a "lead," or stowed among the chimney pots. No, it was on the basement; a big room with a vast expanse of glass, and a lean-to roof. Oh! the number of experiments I made to get the lighting of the sitter absolute perfection. I worked with a flood of illumination enough to make an eagle wink; I reduced the quantity of light until the place was thrown into a state of semi-darkness; I covered up three-parts of the roof and side with tissue paper one week, to strip it all off the next. And the wonderful combination of blinds, from the louvre variety—all right when open, but intensely aggravating when shut—to the plain and simple roller species, I tried them all. The studio was irritatingly situated with a south-east light, and the demoniacal manner in which the sun persistently dodged me, would have converted even a Parsee from being a worshipper of the centre of the solar system, to his enemy. Talk about the sun's spots, indeed! why they are nothing compared to a particular sun spot on my background, which used to stare me in the face, again and again, though I could have sworn I had stopped out every chink and cranny in e place. Another difficulty was the dark-room. The idio had been constructed without reference to this very cessary adjunct, and after running the risk of chronic eumatism from standing in a damp cellar, which for the once was converted into a dark-room, I set to work and ilt one with canvas and paper in the studio itself. Let e say that if anything was more calculated than the sun spoil one's temper and permanently injure the nervous stem, it was that dark-room. The paper and canvas ere perpetually cracking as they got drier, disclosing inute apertures which I only discovered when the plates gged, which they did pretty often. Eventually a proper rk-room was constructed, but at the trials of the make-ift arrangements I shudder even now. Did I make a rtune in the studio? No, I can't say I did. The neighourhood was a new one, and connections, like Rome, are ot built up in a day. I was too impatient, and wanted usiness all at once. And then the majority of the sitters ere children and babies. Occasionally an infant which ad the feelings of a Christian would be brought, but this as rare; the greater portion were quicksilver imps imposible to be quieted, and not to be exorcised by any number f explosive anathemas let off in the dark-room. I made he discovery that photography was not my forte, and one ne day took down my show-case, removed the plate from he door, packed away apparatus, and fled. But the studio vas not to be shaken off so easily. It had been built, and o doubt had its stern destiny to fulfil. For nine years it emained unoccupied, and in the meantime had been used s a living room, a billiard room, and a music room. It is of no consequence to the reader how I came to be drawn back within the spells of photography. Suffice it that the eturn was none of my seeking. Fate thrust it upon me, nd I meekly accepted the position, but not this time as n operator. I became that nondescript being, a sleeping partner, bound to carry out an agreement not made by myself, but which had through force of circumstances devolved upon me. I was to find apparatus and pay the wages of a boy; against this the working partner was to set his services, and the working expenses were to be paid for out of the receipts. This arrangement was to continue for six months, and at the end of that time the working partner was to have the option of leasing the house and studio, buying it right out, or withdrawing from the affair. No doubt the working partner did his best, but he was a novice, and of a worrying, querulous disposition. After some £60 had been expended in apparatus, he wanted more; not that there was any necessity for more, but because he had got his ideas from an old-established and extensive business where he had had six months' experience as a pupil. The list of chemicals he went in for would have set up a small laboratory. Not a tithe of these were ever touched. He persuaded me into buying a huge copying camera, a Ross's doublet lens, an office wash-hand-stand; not once was one of the three used. A lady's dressing apartment was built up in the reception-room; it was not wanted. Whenever I went down to the studio there was always something required which he thought would make the thing a perfect success, but which, I need scarcely say, did nothing of the kind. And the receipts? Absolutely *nil*. At the end of the six months I found myself £50 out of pocket, and the working partner, instead of acting up to the agreement, wanted the studio and house at exactly half the rent previously agreed upon. This was out of the question, and so the W. P. took another studio, and I agreed to let him have the apparatus on hire with the option of purchase. An elaborate agreement was again drawn up, which I now believe to have been quite worthless, and once more my studio was shut up and left to its fate. A year passed over; the new start of the working partner proved a failure, and eventually the whole of the apparatus came back into my hands *minus* the hire, not one farthing of which did I receive.

I looked gloomily at the copying camera; I glared despairingly at the Ross; I shook my head mournfully over the studio chair with its adaptable "backs." What was to be done? There was the studio desolate and reproachful, and I asked myself—why not make a fresh attempt? Accordingly I advertised, extenuating nothing, and certainly setting down naught in malice. I had scores of answers from all parts of the country. A few were evidently from respectable and possibly well-to-do men, but the majority did not favourably impress me with the educational and pecuniary status of photographers. Vile spelling, worse writing, and inscribed on dirty scraps of paper, were the characteristics of three-fourths of the letters I got. I did not take the trouble to answer one of these, but ultimately came to terms with two individuals, one of whom was a practical man, and the other a rash speculator who imagined that photography was a gold mine. He was to find the money to work the said mine, and I need not say that this time I was *not* a partner. The place was let for six mouths, with the use of the apparatus. My tenants went to work, and the studio looked quite smiling again. I am bound to say the practical man worked hard, but he had been used to a fourth-rate business, and went in for ferrotypes at sevenpence halfpenny for nine. And this was not the worst. My studio, which had hitherto been so select, and had never been desecrated by a public exhibition of Sunday work (though I confess that Sunday morning had been a favourite day of my own for photographing friends who could not come out any other time), was converted into a Sunday trading establishment. One indignity it was certainly spared—there was no "tout" or "doorsman," as I believe the gentleman is technically called; but there were the cases hung boldly out on the "Sawbath," and there also was the flaring announcement of "portraits sevenpence half-penny for nine." It was agonising, yet I did not want to throw obstacles in the way of my new tenants doing business. I endured even the Sunday infliction, but was secretly glad when the capitalist, at the end of six months discovered that photography was *not* a gold mine, and decided to give it up. The practical man threw out many broad hints that he would be very glad to carry on the business at a salary, but I had the courage to refuse to be fascinated, and again I performed the operation of throwing the studio into the market. This time I have every reason to believe my cast has been more satisfactory, but it is never safe to prophesy. At the present time my studio is in full work, and I hope the photographer is making a fortune. At all events, I pray that it may not prove to me an old man of the sea whom I can never shake off, or a demon who is bound to torture me at stated intervals. Life, we are told, is short; but on the other hand art is long, and it may so happen that in my case art (photographic, I mean) may have the best of it.

DRY PLATES, DARK-ROOMS. AND PRINTERS

BY GEORGE BRADFORDE.

When I first thought of saying anything about dry plates I had nearly come to the conclusion that I had previously said everything that I had to say, unless it might be that I would prefer to work them in summer as well as in winter; but being a workman, not a master, I have to submit to the rules of the establishment, and thus have to work both wet and dry. The reason of this is not excellence of work in either process, but a matter of expense. Everyone knows that a spoiled collodion plate or two means only a few pence, while a spoiled gelatine plate or two means as many shillings. Yet I would fain try to prove that photographers having only one small dark-room, and who try to develop both wet and dry plates indiscriminately, are really—to use an old saying—"penny wise and pound foolish." There are many first-class houses which can only boast of one dark-room. I will allow that the dry plates taken through the day are developed in a batch at night, and possibly the silver bath removed out of reach of the fumes of the ammonia and the infinitesimal flying particles of pyrogallic. I have tried this, and find that it will not work. Despite every precaution, the silver bath *would* get pinholey and opaque; comets with two tails at right-angles *would* come and spoil the beauty of the plate. In this case, perhaps your first sitter in the morning is a business gentleman whose time is money, and you rush to your collodion and bath, carefully scum the latter, expose and develop, to find a plate looking more as if it had been sensitized in pea-soup than nitrate of silver. You try another; the plate is cleaner, but there happens to be an opaque streak on the tip of the nose, tapering finely away to the left forehead. Still, this plate is more hopeful than the last, and another is hurriedly prepared, every precaution as to dusting and draining the dark-slide being carefully looked to, and the unfortunate sitter is requested "to try once more." By this time he (the sitter) keeps looking at his watch, and eyes the operator suspiciously, as much as to say he was half of opinion that he did not know much about his business. This plate is worse than any; the operator dashes it down, draws the ruby-glass shutter, and rushes back to the now almost frantic sitter to expose a dry plate. This latter is a success photographically, but the expression is frightful; it represents a man full of impatience, anxiety, and doubt, and, of course, the proof is returned in disgust. Now, had the dry plate been used at first, a pleasing and profitable negative would have been the result, while there would have been no loss of time, silver, or other chemicals. Not only that: look at the amiable mood the man of business would have gone forth in, and the photographer, with unshaken nerves, would have looked pleasantly forward to the next sitter.

Now with those, again, who wish to oblige every customer. The master who wishes both processes to be worked is an awful Nemesis to the workman; for instance, one has two or three adult sitters, and upon them he uses collodion; then comes a baby, and the gelatine is then in demand; other adults are in waiting, but the mamma will not depart until she has ocular demonstration that *something* has been obtained of her darling, and, of a consequence, the dry plate has to be developed *instanter*; the result with the next collodion plates are the same as described above. "Pennywise and pound foolish," I repeat once more. Such was my experience last summer, and it nearly drove me frantic. If photographers are going to work both wet and dry processes, let them have separate dark rooms, and then all trouble such as I have described will partly cease. Heaven knows that in the dog-days we have trouble enough to keep the silver bath in working order, without the additional annoyance of ammonia and pyrogallic.

Now with printers: I do not know how others get along with the dry plates; but I had two that hated them most heartily. They had all manner of faults to find with them. They took long to print—they could not see the part they had to shade—and as to vignetting them, it was next door to an impossibility, and a hundred other complaints. One great complaint was, that after the first print or two the negative developed a lot of minute specks that gave the under-printer no end of trouble to spot on the prints.

I shall finish by saying that it was very singular that when I myself printed, I found none of the above difficulties; indeed, it is my opinion that printers, as a rule—especially those stick-in-the-muds who know no more to-day than they did fifteen years ago—have a mortal antipathy to the innovation of dry plates. "Operators only praise them up because they make less work," sarcastically observed a printer within my hearing. In my estimation they do not make less work; there is more patience required in developing; there is more care needed in the washing, and watching in the drying, together with extreme vigilance and caution in exposing and keeping the plate from light. And again, look at the number of sitters one can take in the course of a day, and say if they make less work.

ON THE SO-CALLED CRYSTALLIZATION OF VARNISH.

BY ALFRED J. BROWN.*

SEVERAL negatives have been shown here which had apparent crystalline markings upon them, and one whereon the varnish was in powder. It was said to be due to the hyposulphite left in the film, one or two gentlemen going so far as to say they could taste it. Now both these forms of the breaking up of the varnish are due to the same cause—viz, the swelling caused by moisture of the gelatine. Hyposulphite (our friend the enemy) has nothing to do with it; neither is there any crystallization. It is really surprising what a quantity of hyposulphite may be in the film, and yet not crystallize out. I made a 20-grain solution of gelatine, and dissolved in this seven or eight grains of hyposulphite, and coated some plates with it; the plates dried clear, the gelatine holding the hyposulphite in bondage. I had to increase the hyposulphite to a very large extent before I could get any markings, and then not in the form shown upon the negatives. It is well known that strength of solution, temperature, and speed of evaporation, somewhat alter the size and form of crystals.

Here is a plate showing the varieties of hyposulphite, from a pretty strong to a saturated solution with gelatine. You will see that as the plate dried, it has left three pretty distinct forms of markings. I do not call them crystals, for under the microscope they do not appear to me as such; but I may be mistaken. The plate drying at the edge first, and so on towards the centre, has squeezed the hyposulphite before it until it became a saturated solution, when no further alteration took place, as you see in the large patch near the centre. For the possible effect upon the image, of course it is best that the hyypsulphite should be got rid of, otherwise I believe there need be no prolonged washing. So much for the hyposulphite theory. I next coated some plates with a 20-grain solution of gelatine, dried, and varnished them. Here is one which has been placed in water for a few minutes. You see the result. If the varnish be thick, and resists the action of moisture pretty well, it will probably only be attacked in parts; if you examine a few negatives, you will very likely find in the varnish here and there a speck of foreign matter that has settled (either on the film or the varnish) before it was dry. This speck, by capillary attraction, has appropriated the greater part of the varnish from a small space surrounding it; this is a weak spot, and is first attacked.

I show you a plate dried purposely in a dusty place, varnished, and placed in water for a few seconds; it is covered with these markings, very small, because they are so close. There is not room for them to grow to any size before they reach each other, and the whole of the varnish is raised; nevertheless, they are identical with the larger ones.

Here is a micro-photograph of a group from that plate which I saw grow; here is also a part of one from this plate. You will see where I have scratched my initials through the varnish, there it has split up in the accustomed form. The action is this:—The gelatine swells at a certain point, it is raised above the normal level, the moisture spreads outwards in all directions, swelling the gelatine; it also creeps a little over the edge of the varnish holding it down. At a little distance a rupture takes place—this is very sudden—and a narrow plate of varnish is burst up; this is repeated again and again, so long as moisture is there and there is varnish to raise. They are in the form of a rosette when made with plenty of moisture, but sink to the saucer form when dry. This action appears to carry with it a portion of the softened gelatine, else I cannot account for the appearance of these markings. Even upon the removal of the varnish, the marks are still there.

I have washed a few of these scales off one of the plates; here is a photograph of them. They are not broken up so small as if a very friable varnish had been used, but they appear as a coarse powder. If any gentleman has a powdery negative by him, I will photograph and show it; I have not one. It will be seen from these remarks, that a gelatine negative is ever liable to damage so long as it is coated with an unexpanding varnish that will allow moisture to penetrate. I think it is not generally understood how great is the affinity of gelatine for moisture. If you use, as Mr. Payne Jennings advocates, collodion— or possibly Mr. Henderson's collodion, ether, and varnish—it is a step in the right direction. I myself see no reason why an oil varnish should not be used, it would be a little longer in drying, I think—that is all.

I should like to ask, before I close, whose idea it was to put astor oil—and in some receipts even essential oils—in the varnish? 'hese (the essentials) of course evaporate, leaving the varnish orous; but what becomes of the castor oil? True, it dissolves 1 the spirit, but when that is gone, where is your oil? Neither hellac nor sandarac dissolves in it, so the mixture can only be 1echanical. I cannot satisfy myself, so ask you, does the gelatine bsorb it, and leave the varnish like a sieve? I would just add, y all means *filter* your varnish: allowing it to settle even for nonths will not do, for under the microscope there are innumerble particles of insoluble matter which form centres for the soalled crystallization.

---

* Read before the Thursday Evenings for Photographers.

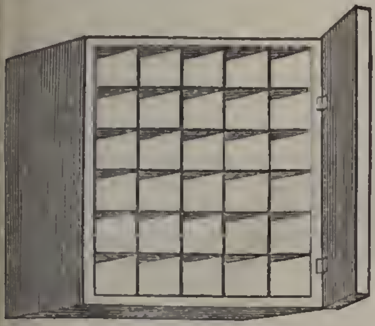
◆

AN IMPROVED SENSITOMETER.*

BY J. D. MUCKLOW, F.I.C., F.C.S., AND J. B. SPURGE.

'E need scarcely say the want has long been felt of a 'eliable, easy, and inexpensive method of ascertaining the legree of sensitiveness and gradation or range of tints of 'arious films, which results shall not only be comparable 1mong themselves, but also bear a uniform and definite rela-.ion to some fixed standard.

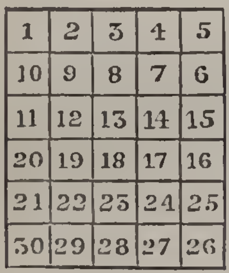
We think the instrument before you will remove the present 1ncertainty and vagueness in expressing the relative sensitiveness of any plate, so that photographers in different parts of the world can compare and verify with certainty the sensitiveness of any plates they may be using, and be able to express that sensitiveness in terms which shall be understood throughout the photographic world.



A

Back of Sensitometer,

With the lid open, showing the chambers,



1	2	3	4	5
10	9	8	7	6
11	12	13	14	15
20	19	18	17	16
21	22	23	24	25
30	29	28	27	26

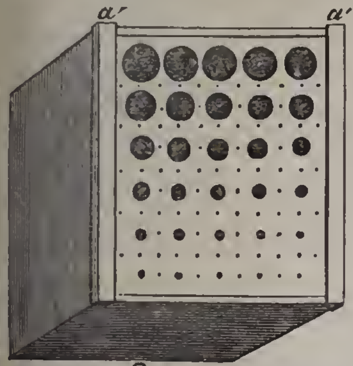
B

Stencil Plate or Glass Cover

to the chambers, and on which the plate to be tested is placed.

The instruments now used are made of materials so irregular in their physical properties, as well as being subject to atmospheric influences, that it was very difficult to obtain instruments giving uniform and similar results until Mr. Spurge happily thought of regulating the amount of light by employing different sizes of openings.

The instrument consists of a number of tubes or chambers of any convenient size or shape, as shown in Fig. A; the front or top of these tubes or chambers is closed by an opaque plate, in which holes are drilled (bearing to one another any desired ratio), so as to be in the centre of the front or top of each tube or chamber, as shown in Fig. C; at each side of the top are brass slides and springs (marked *a′ a′*), in which slides the thin vulcanite cover, Fig. D, completely closing all the apertures.



C

Front or Top of Sensitometer, showing apertures lighting the chambers. *a′ a′*, brass springs.

D

Loose Back,

To slide under the brass springs (*a′ a′*), and cover the apertures.

To use the instrument with daylight, gas, or candle, this cover is removed, the trial plate first being placed upon the plate B, which covers the tubes shown at A, and the lid closed; the front or top, with the apertures, is then placed in its position before the light to be used.

When the phosphorescent calcium sulphide is used, the cover remains in its place, closing the apertures, and the excited plate of the calcium sulphide is pushed into its place between the apertures and the cover, thus illuminating each chamber according to the size of its aperture.

The holes may have any ratio to each other, from 1 to 1,000, or 1 to 30, and each hole would be drilled to a gauge, so that having a series of these gauges, any number of instruments could be prepared, all of which would give uniform and similar results. We believe that instruments prepared from one such series of gauges may be fairly accepted as standard instruments, since they are simple in construction, suffering no deterioration by use, and would give results thirty years hence uniform with those obtained to-day, and are easy to work.

◆

COLOURED TRANSPARENCIES FROM SILVER IMAGES.

BY C. R. WOODS.*

It has long been known that a pleasing chocolate-brown tone can be given to transparencies by pouring over the film, after it has been fixed and washed, a solution containing a salt of uranium and the ferricyanide of one of the alkalis. The formula usually used is—

Uranic nitrate or sulphate	4 grains
Ferricyanide of potassium	4 „
Water	1 oz.

To which a few drops of a solution of chloride of gold are sometimes added.

It may not be so generally known, however, that a solution of ferricyanide of potassium and a ferric salt are reduced in a like manner, the deposit, as might be anticipated, being of a bright blue colour. A little uncertainty attending some of the results at first obtained, it may, perhaps, not be out of place here to describe two of the experiments carried out in the investigation of the reaction.

If a solution of ferric chloride be poured over a silver image in collodion, and the solution be poured off into a test-tube, and a few drops of ferricyanide of potassium solution be added, a precipitate of Turnbull's blue is formed, showing the reduction of the ferric salt to the ferrous state. The character of the image is altered by the formation of chloride of silver, producing a picture of an agreeable soft-grey tint, which may keep for a time, but would not be permanent. This image is of course removed by ammonia or hyposulphite of soda.

It a silver image be treated with a solution of potassic ferricyanide, and the solution be poured off and tested with ferric chloride, a precipitate of prussian blue is formed, this reduction, however, taking place much more slowly than that of ferric chloride.

Although ferric salts form a definite compound with ferricyanic acid, the foregoing experiments may nevertheless be considered to indicate that in the formation of a blue image in the manner referred to, whilst both prussian blue and Turnbull's blue are formed, it is the latter which makes up the larger proportion of the resultant image.

If the toning solution used contains ferricyanide of potassium in considerable excess, soluble prussian blue (in which, as you are aware, the potassium is only partially replaced) is liable to be formed, and this, in addition to colouring the whites of the picture, is likely to lead to the disintegration of the film during the subsequent washing. On the other hand, if the ferric chloride be in excess, the precipitate is formed too much on the surface, owing to the rapid formation of chloride of silver, and is in this case easily carried off by a flow of water. The ferric nitrate would be the best salt to use; but as this is seldom to be found in a photographer's laboratory, the following formula will be found most useful:—

Make two solutions, the first containing—

Ferric chloride	4 grains
Water	1 ounce

---

* Read before the Photographic Society of Great Britain.

the second containing—

Ferricyanide of potassium	9 grains
Water	1 ounce

mix equal quantities of the two solutions immediately before using, or, if they are kept mixed, the bottle must be placed in the dark-room. Although the quantities seem rather disproportionate here, the ferricyanide of potassium is only slightly in excess. Excess of the ferric salt is advisable, if the nitrate be used.

From a blue picture thus prepared, transparencies in yellow, yellowish-brown, and green may be obtained.

To obtain a yellow picture, flood the image with a dilute solution of sodic or potassic hydrate; the blue compound is thus decomposed, and ferrous-ferric hydrate left in its place, giving it a yellow appearance; this turns a little darker on drying, the picture still appearing yellow when held up to the light, but when projected on to the screen appears, when all the silver has not been replaced, of a rather pleasing rusty brown tint.

To obtain a green picture, treat the silver image with the blue-toning solution till the greater part of the silver is replaced by the ferrous ferricyanide, leaving, however, a thin substratum of silver. When it has reached the proper stage may be judged from the appearance of the back of the film. Convert this blue picture into a yellow-brown one by the use of sodic hydrate, wash, and again pour over the plate the ferric-ferricyanide solution. The picture thus obtained is dark green.

In preparing these uranium or iron pictures, if the solution be dilute and kept on the film for but a short time, the picture may be only lightly toned, or with the solution of full strength the silver may be entirely replaced and the transparency be rendered completely brown or blue. By combining the two salts various intermediary tones may be produced, from an olive-brown to a dark green bordering on black. It must be recollected, when combining the two solutions, that the iron compound is reduced more readily than the uranium one.

The blue transparencies are particularly suitable for astronomical diagrams, sea-views, &c. Amongst other subjects to which the brown tones are particularly applicable may be mentioned pictures of insects. Some copies taken from insects mounted in Canada balsam for the lantern look surprisingly like the originals when projected on to the screen, and photo-micrographs similarly treated would have very much the same appearance as the objects themselves viewed under the microscope by transmitted light.

With the exception of the brown and green pictures requiring the use of sodic hydrate, these processes are equally applicable to wet plates, collodion emulsions, and gelatine. With wet plates a very weak developer should be used. In all cases the one thing needful is the careful removal of all traces of hyposulphite; otherwise the whites are not left pure. With collodion plates, traces of hyposulphite may be completely eliminated by dilute hydrochloric acid, though thorough washing is preferable. After the picture is sufficiently toned, dilute acid may be poured over it to thoroughly fix it before it receives the final rinsing with water. With gelatine plates the use of acid is out of the question, but the colour is held sufficiently firmly in the film.

In conclusion, these pictures may be regarded as permanent, neither exposure to bright sunlight for five hours, nor heating in an oven for twelve hours, having produced any alteration in the colour.

KEEPING EMULSION.

BY ARCHER CLARKE.

On the festival of St. Guy Fawkes, I coated some plates from an emulsion made in March or April last, and on November 22nd I photographed over 100 children sitting at their desks in a school-room—every head quite free from movement. The precautions observed were that the emulsion was thoroughly washed, then re-melted at a low heat; and, when sufficiently set, methylated spirit added to about half an inch deep on the top of the emulsion, the whole (forty ounces) being kept in an earthenware jar with a cover in a cool ventilated place.

The plates used about November 9th frilled a little, but on the 26th there was no sign of frilling, and a better plate I do not desire to use.

I forgot to say the emulsion was boiled half an hour, and hydro-bromic acid added just before boiling.

> "We learn upon a hint,
> We find upon a cue."

HOW TO MAKE A CHEAP FOLDING CAMERA STAND.

BY KENNETH BEAN.

First procure from a joiner on a timber yard a piece of oak or ash, $\frac{3}{4}$-inch stuff, and 36 inches long; plane up both sides, and mark with a guage 9 strips, $\frac{5}{8}$-inch apart; this will allow for planing; rip them out with a saw, plane up, sand-paper. Then with a piece of hard rolled brass, $\frac{1}{16}$ inch thick procured at any watch-maker's tool shop, cut three plates 2 by $1\frac{7}{8}$ inches; on the long sides, at $\frac{1}{4}$ inch from edge, drill three holes, three on each side (fig. 1); countersink them, to allow the screws to be level; then cut six smaller pieces of brass 2 inches long by $\frac{5}{8}$ inch wide. These are for the triangle end of the stand; drill three holes in each (fig. 2); countersink two, which are for screws, leaving one plain for the pin in triangle. Now measure and cut off the strips; two, 31 inches, and a third, 30 inches long; place them side by side, the shorter in the middle; lay one of the largest plates on the top of them, two inches from the left hand (fig. 3): screw it on with half-inch brass screws. On the right hand of the plate, at a distance of $\frac{5}{8}$ of an inch, bore a hole through the three strips, into which drive a $1\frac{3}{4}$ inch screw; this makes the hinge.

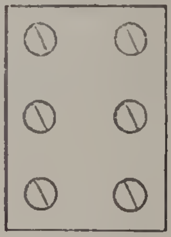


Fig. 1.

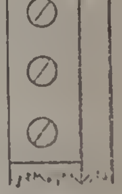


Fig. 2.

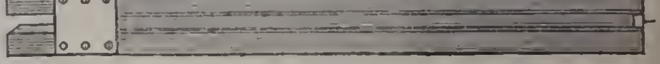


Fig. 3.

On the ends of the outside strips screw the smaller plates, cutting the wood away the thickness of the brass to make them level with the surface of strips. Into the end of the centre strip drive a French wire nail, and with a file cut off the head and smooth the point. A piece of brass tube put over the end will prevent the wood splitting.

To finish, run a file round the edges of all the plates, and bevil them off; file the screws flush with the plates, keeping the scores in them all in the same direction. Apply oak varnish, and lacquer the brass-work. When the varnish is dry, put a small strap round the folded legs, and drive a screw through the strap into the middle leg, one at each end of legs, and a piece of leather with a screw through each end makes a neat handle. The whole of the material will not cost more than three shillings and sixpence, and of course the labour and time; which, to an amateur, would be a labour of love and a pleasurable work.

Correspondence.

COMMERCIAL DRY PLATES.

Sir,—I am at a considerable disadvantage in replying to any letters in your journal, being three days' post from England.

There was a valuable article in your journal of December 2, by Mr. Lyddell Sawyer, on which I was writing a few remarks, when the News of December 9 came to hand, in which I saw three letters all referring to myself. I thank the writers, on behalf of the general photographic public, for their information and advice.

They seem, however, to be a curious set of individuals. One appears to be a retired butcher, as he compares sensitive dry plates to butcher's-meat; another, a superannuated prize-fighter, who is eager, like the baker's old charger, to return to the cavalry service he had been sold out of years before, and he wants "to put on the gloves" again. All these persons appear to be interested in the commercial dry-plate business, and well accustomed to the perversion of facts that fail to tally with their own interests. The style of their writing recals the class of men who, years ago, made their living, and sometimes large fortunes, out of photography, and who were regarded by the outer public as by no means an educated or high class of men, without the qualifications of artists or the habits of gentlemen.

I am also placed at a disadvantage from the fact that my letter on the question of commercial dry plates, addressed to the Council of the Photographic Society, has not been published in the photographic journals, as so many of the readers of the journals do not belong to any photographic society; and I will again ask the Editor of the Photographic News to remedy this omission.

I will ask your butcher's meat correspondent this question: How is meat that is tough or rotten to be compared to a batch of sensitive dry plates? The meat can be at once tested by the smell, or its toughness by the teeth; but how can dry plates be known *until development*, when it is *too late* to return them, and when a number obtained from a maker who has hitherto supplied good plates sends out, from want of testing, or other reasons, a batch of worthless plates?

Your correspondent "Not at Sea" states that the coating of gelatine dry plates requires the greatest care and dexterity. He is too scientific a gentleman to compare sensitive plates to butcher's meat. But so also did collodio-bromide or other dry plates of a few years back; *yet children and ignorant persons were often employed in their preparation.* According to Mr. Wharton Simpson's statement, with gelatine plates even more care is required in preparing them. This writer states the great care there is now taken in testing these plates, and I do not doubt, if all the precautions he states are really taken both with the emulsions and with the plates, that there would be very few faulty plates to complain of; but I believe that these "tests" very often exist in theory, not in practice, with the consequences that Captain Turton will bring further proof of.

Mr. "Not at Sea" states a number of matters known to any experienced worker of dry plates, and known to me years ago, before gelatine came into the market. He doubts my statement that I have worked dry plates by hundreds and by thousands; but having worked them for more than ten years, I have many boxes full of negatives and transparencies to show as proof, besides a number of bad plates that I have kept to show the sort of articles sometimes sent out by the dry-plate manufacturer.

As one of your correspondents likes dates, I refer him to the Photographic News of November 7th, 1879, where he will see an article on "Photography in the Navy," and the name of Captain Turton, and he will find shortly that Captain Turton can produce other evidence equally important, and more recent, than that of the late editor of the Photographic News, confirming his remarks on the present unreliability of commercial gelatine dry plates.

I must apologise to the Editor and the readers of the Photographic News for taking up so much space in replying to such correspondents or noticing their letters.

I shall probably address a further letter to all the societies on this question and other questions affecting photographic interests, whether as regards (so termed) amateur or professional photographers.

Regarding Mr. Lyddell Sawyer's able and interesting article, I would beg to refer to one or two of the points he deals with.

Mr. Sawyer states that "various emulsions, even from the same makers, sometimes require extreme modifications of developers." I demur to this, and state that no modifications of developers will get a negative from plates too thinly coated, a batch of which I have lately received from England, and a number of the developed plates I have retained for proofs. Some years ago, when using the collodion emulsions sent out by the "Uranium" and "Liverpool Dry Plate Companies," I had on more than one occasion some emulsion sent me too thin to produce any good negatives. On representing this to the makers, I was supplied with emulsion giving excellent negatives; but how about plates prepared and sent out with too thin an emulsion? The late respected Editor of the Photographic News used to state in the journal that the "amateurs" were the pioneers of photography. The gentleman who writes this letter will probably prove himself (despite the sneers of your three valuable correspondents) to be one of them.

There are now (according to the Photographic News) a number of "professional" portraitists who use entirely commercial gelatine plates for all their work. It is obvious that these gentlemen must be supplied with reliable and uniform plates. It seems probable, therefore, that these large consumers are supplied with good and well-tested plates, and that the poor despised "amateurs" and the smaller "professional" consumers get those prepared with thin or spotty emulsions, which are not properly tested, but good enough for the general public and for "amateurs," who are supposed by the so-called "professional" photographer not to know a good plate from a bad one. I end this letter by quoting Mr. L. Sawyer's last paragraph in his article of December 2nd, with which I entirely agree:—"After all that is said about art, so much does the everyday success of the practical photographer depend on technical quality that verily 'Dufter' with reliable plates is superior to a duly qualified man who is harrassed by the vagaries and uncertainties occasioned through the use of frequently varied emulsions."—Faithfully yours, Francis W. Turton.

P.S.—I have shown my circular letter to the head of the Italian Government Photographic Department at Florence, and also read him the correspondence, including the three letters of December 9th in the Photographic News. He considered the subject a most important one, and stated his opinion that the three letters of your valuable correspondents were inconsequent, and did not touch the points at issue; and he further expressed his surprise that I should take the trouble to reply to them.

[We still continue to receive many letters anent "Commercial Dry Plates," but with this reply of Capt. Turton, we are compelled to close the correspondence.—Ed. P.N.]

PUBLISHING CHRISTMAS CARDS.

Sir,—My attention has been called to your article on the publication of Christmas cards, and I have to inform you, as you can see for yourself, that I make it a rule to give a discount, not of twopence, but of threepence in the shilling to the public; hence my profit is not so large as may be supposed.—Yours truly, Retailer.

Dear Sir,—We have read your remarks on publishing and selling Christmas and birthday cards. I do not think you are quite fair, either to ourselves (who are wholesale dealers) or to the shopkeeper. You say that sometimes a discount of twopence in the shilling is allowed to the public. I know that threepence in the shilling is frequently deducted, and some of the London shops even go so far as to allow fourpence; so that, in the latter case, there is only a difference, on your own showing, of fivepence (for you state that the photographer receives threepence) to be divided between the wholesale and retail houses. We deny that the amount is as large as this; but even if it were, the business expenses, travellers' commissions, loss from spoilt and unsold stock, &c., will account for a great deal of it. So I do not think the photographer has much to grumble about. By all means let him try selling on his own account, if he thinks he can do better.—Faithfully yours, X.

LITTLE MATTERS.

Dear Sir,—Will you kindly correct an error in your last issue? Page 605, sixth line from bottom should read, "half drachm of above to four ounces of alcohol."

I should like to ask M. Leon Vidal if it is a fact that under the circumstances he mentioned (p. 607) he has seen registered the exposure of $\frac{1}{50}$th second? From experiments I made in the summer sunshine with quick shutter exposed upon a fifty-inch rotating bicycle wheel, half the rim of which was black, the other half white, I have doubts as to the possibility of any portable shutter exposing the aperture of a rapid lens—more especially for plates of respectable size—in the time. Speaking generally, shutters do not work at anything like the speed claimed for them. Alf. J. Brown.

Proceedings of Societies.

Thursday Evenings for Photographers.

A meeting was held on the 22nd inst., the chair being occupied by Mr. C. G. Collins.

A cheap emulsion filter was exhibited by Mr. Henderson, which consisted of an ordinary mineral oil lamp chimney, over the bottom of which a piece of wash-leather was stretched. The emulsion was placed in this, and the top closed with a cork having a small piece of rubber tubing passed through it. Upon blowing into the tube, the emulsion is rapidly forced through the wash-leather. He also showed another form of filter, consisting of a piece of cane inserted in a glass funnel; a notch was cut in the cane, and the emulsion filtered through it.

Mr. A. J. Brown then read a paper on "The So-called Crystallization of Varnish" (see page 620), illustrating his remarks with several specimens of the different markings.

Mr. A. Haddon said that hyposulphite might leave a sulphate in the film, which would floresce, and so breaks up the varnish.

Mr. Henderson had never found a varnish that would thoroughly stand exposure to air and moisture.

Mr. Brown thought that collodion, as recommended by Mr. Payne Jennings, was the best positive.

Mr. Henderson suggested collodionising the plate, and then waxing it.

Mr. Debenham thought it would be an improvement if the wax was dissolved in spirit.

Bolton Photographic Society.

The December meeting was held at the Baths on the 5th inst., Mr. Harwood in the chair.

The meeting was an open one, occupied with a lantern exhibition given by Mr. R. Harwood, and was evidently much appreciated, the room being crowded. Slides were exhibited by Messrs. Banks, Tong, Boothroyd, Fothergill, &c. Mr Harwood also exhibited a number of slides from his own negatives.

Mr. Boothroyd exhibited an opaque lantern, by means of which the works of a watch, &c., were shown on the screen.

The meeting closed with a vote of thanks to Mr. Harwood and the exhibitors.

Talk in the Studio.

South London Photographic Society.—The annual popular optical lantern meeting will be held on Thursday, January 5, 1882, in the large room of the Society of Arts, Adelphi. Slides will be exhibited by members and others. The lantern arrangements will be managed by Messrs. W. Brooks and F. A. Bridge.

Mr. Gladstone and his Grandchildren.—Mr. Fall, of Baker Street, sends us some delightful portraits of the Premier and his family, the results of a personal visit of Mr. Fall to Hawarden.

Mr. Oborne's New Premises.—Mr. Oborne is anxious that our readers should note his removal to more extensive premises at 26, Red Lion Square, W.C.

A Dinner under the name of a social gathering was given by the employeés of Messrs. W. & D. Downey, at the Holborn Restaurant, on Wednesday, the 21st, Mr. W. Downey himself being among the company. Several good songs and clever recitations were contributed, greatly to the amusement of the evening, the gentleman who presided at the piano being also very successful in his endeavours to please. Altogether a most agreeable evening was passed.

To Correspondents.

W. B. Reid.—The second or the fourth would generally be preferred. In the case of the last-mentioned, any pigment may be used; but the tint is more or less degraded by the colour of the chromated gelatine base. Hence it is impossible to obtain an ordinary carbon print with a black tint as clear and good as is realised in the case of an engraving which has been printed with a good sample of ink.

H. Colard.—The solution should be tolerably thick, like starch paste, and when (as is sometimes the case) the dextrine has been imperfectly baked or converted, it may be necessary to employ a little heat, and to reduce the proportion of methylated spirit. 2. An exudation from the *Guniperus Lycia*. 3. The volume of the Photographic News for 1880 is out of print.

T. Rees.—Not nearly so much as one would suppose.

C. T. Froude.—1. If it be moistened with a few drops of alcohol it may be readily pulverized. 2. The facts bearing on the case are well ascertained and established, but, owing to the indefinite way in which chemists use most of the terms, it is impossible to answer you either with a simple negative or a direct affirmation.

A Printer's Assistant.—1. Thank you for the reminder. 2. Absolute alcohol is best. 3. When a moderate excess of acid is used there is no precipitate.

S. T. J.—We are informed that the subject is likely to be brought before the Committee shortly.

Bath.—Add more silver; probably an addition of ten grains to each ounce would be satisfactory.

Pigment.—It is a difficulty which frequently occurs in damp weather, as when the tissue dries very slowly the same kind of change occurs which a short exposure to light would produce. Discard the out-building till the hot dry weather returns, and dry in a room where a fire has been burning all day. A little ammonia may be added to the sensitizing bath, and a few drops should be sprinkled on the floor of the room.

Carlo.—A careful filtration of the collodion may prove a remedy; but the addition of about four drops of water to each ounce should cause the minute particles of potassium iodide, which occasion the mischief, to dissolve.

Pontis.—The method of preparing is a secret, but you can purchase it at almost any photographic material warehouse.

H. C.—1.—By such a process as is used for enlargements on iodide paper. See Captain Abney's "Instructions." 2. Either the lenses are bad, or you do not manage them rightly; but without further information we cannot help you. A portrait lens which will not sharply define such type as this is printed with, the printed matter being at a distance of twenty times the equivalent focus of the lens, is decidedly bad. The observation should be made either with an eye-piece, or an extremely fine ground glass should be used.

W. Wilson.—Do not part with any money until some enquiries have been made, as attempts are often made to extort money under similar circumstances. We will make enquiries.

O. H. Evans.—1. The prints should be well soaked in water before immersion in the toning bath. 2. Send us a print of one of the snow scenes.

Otto P.—Just received. Answer next week.

Sulphur.—Fuse it at a lower temperature, taking care that no part is over-heated.

M. T. Barker.—Not by any means a safe experiment for one who is accustomed to chemical manipulations.

Fix.—An exposure of one-thirtieth of a second will not be too much.

Amateur.—The economy of the process is very doubtful unless you have nothing else to do; in any case, you had better take the advice to which you refer.

GETTY CENTER LIBRARY
3 3125 00899 2022